

ArcelorMittal Europe

Long Products

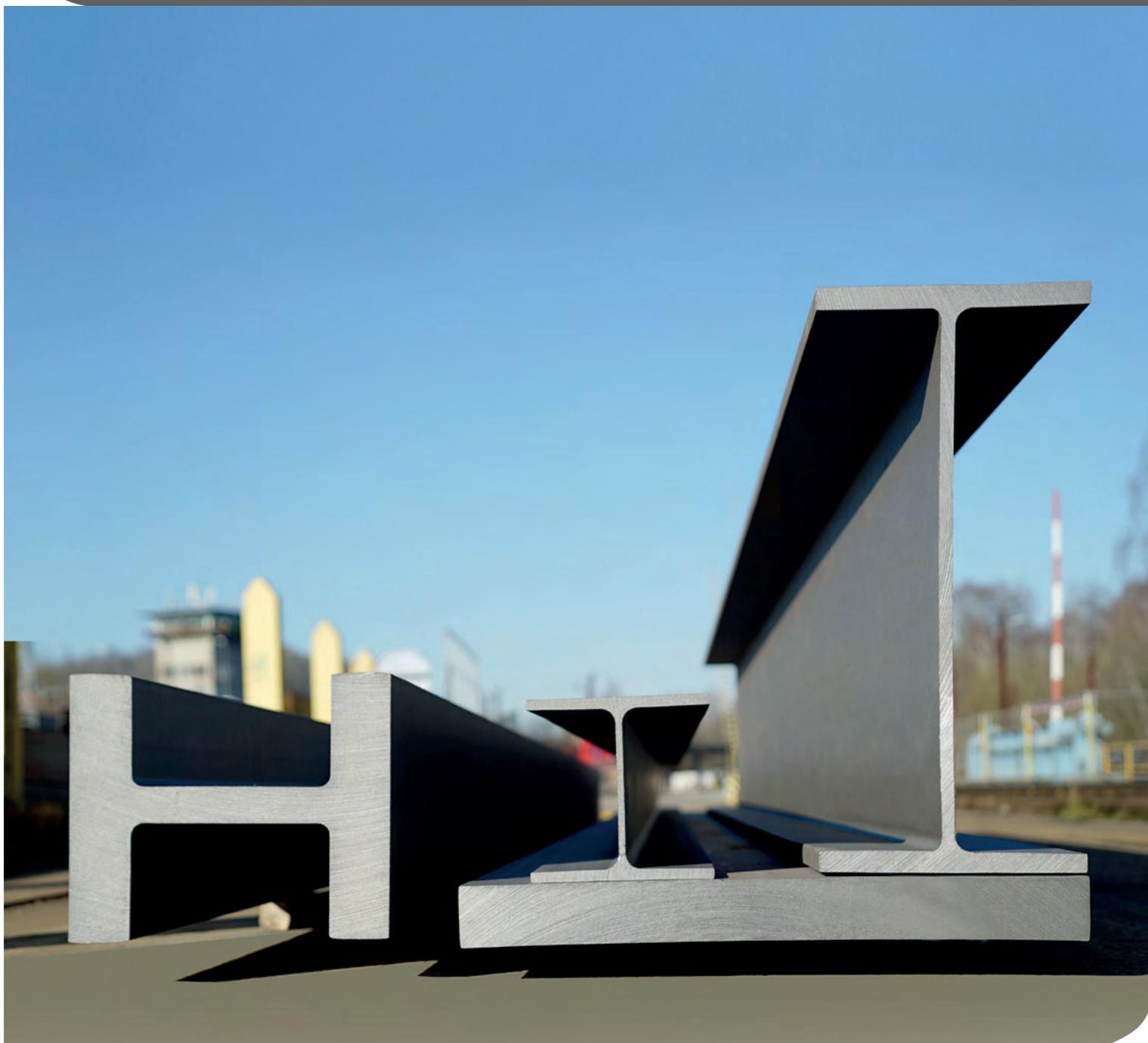


ArcelorMittal

Sections and Merchant Bars
Perfiles y Barras Comerciales
Kształtowniki i pręty walcowane na gorąco

Sales Programme / Programa de Ventas / Program sprzedaży

New
steel grades
A913 (2019) Grade 80
EN 10025:2019
S500M
S460W



The Imperium at Capitol Commons
Pasig City, Manila, Philippines



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Jobsite welding of heavy shapes in steel
ASTM A913 Grade 65 [450] (HISTAR® 460)
without preheating, according to code
AWS D1.1 (ETA 100 156).



Steel grades and qualities

Grados y calidades de acero

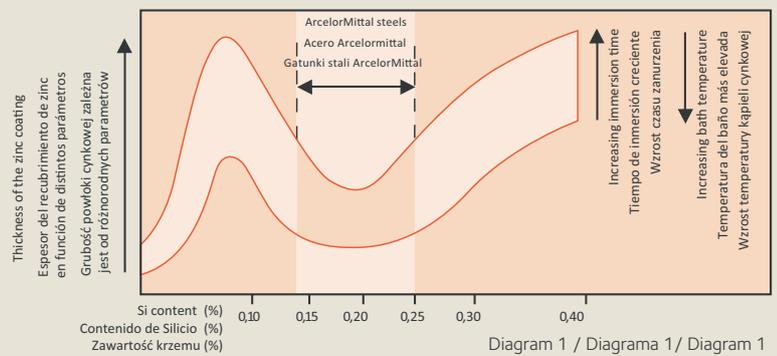
Klasy i gatunki stali

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Steel grades and qualities

Grados y calidades de acero

Klasy i gatunki stali



Designation system for steels

The European standard EN 10027-1:2017 defines the designation system for steel. The usual symbols for structural steels are shown in table 1.

Structural Steels

The available structural steel grades according to European, American, Russian and Chinese standards are shown in tables 2, 3 (EN), 10 (ASTM), 11 (GOST) and 12 (GB). Other grades (Canadian CSA standards for instance) are available upon request.

Steel grades in accordance with EN 10025-2:2019 and EN 10025-4:2019 are available upon request with improved through thickness deformation properties with respect to the resistance to lamellar tearing (Z qualities).

Table 13 shows a list of corresponding designations between the European standards as well as the HSTAR® grades with those from the American, Canadian, Japanese and the former national European standards.

The steels are typically delivered with a Si content ranging between 0.14% and 0.25%, and are as such capable of forming a zinc layer during hot-dip galvanisation (diagram 1). As the phosphorus content of these steels is usually lower than 0.035%, it does not have any influence on the final thickness of the coating in the considered Si range.

The mechanical characteristics of ArcelorMittal's sections are improved by precise control of the temperature during the rolling process.

Sistema de designación de los aceros

La norma europea EN 10027-1:2017 define el sistema de designación del acero. Los símbolos habituales de los aceros estructurales se muestran en la tabla 1.

Aceros estructurales

Las calidades disponibles de acero estructural según las normas europeas, americanas, rusas y chinas aparecen relacionadas en las tablas 2, 3 (EN), 10 (ASTM), 11 (GOST) y 12 (GB). Previa solicitud están disponibles otras calidades de acero (normas canadienses CSA por ejemplo).

Las calidades de acero de acuerdo con la EN 10025-2:2019 y la EN 10025-4:2019 están disponibles bajo pedido con propiedades de deformación mejoradas a través en el sentido del espesor con respecto a la resistencia al fenómeno del desgarro laminar (calidades Z).

En la tabla 13 se muestra una lista de correspondencia de designaciones entre las normas europeas y las calidades HSTAR® y sus correspondientes designaciones americanas, canadienses, japonesas y nacionales europeas anteriores.

El acero suministrado tiene normalmente un contenido de silicio (Si) que oscila entre 0,14% y 0,25%, por lo que tiene la capacidad para formar una capa de zinc durante la galvanización por inmersión en baño caliente (diagrama 1). Dado que el contenido en fósforo de estos aceros es inferior generalmente al 0,035%, no ejerce ninguna influencia sobre el espesor final del recubrimiento para el rango de Si considerado.

Las características mecánicas de los perfiles fabricados por ArcelorMittal se optimizan mediante un control preciso de la temperatura durante el proceso de laminación.

Znakowanie gatunków stali

Europejski standard EN 10027-1:2017 ustala system znakowania gatunków stali. Typowe znakowanie gatunków stali konstrukcyjnej jest przedstawione w tabeli 1.

Gatunki stali konstrukcyjnych

Dostępne gatunki stali wg norm europejskich, amerykańskich, rosyjskich oraz chińskich są przedstawione w tabeli 2, 3 (EN), 10 (ASTM), 11 (GOST) oraz 12 (GB). Inne gatunki stali (np. zgodne z normą kanadyjską CSA) dostępne są na indywidualne zamówienie.

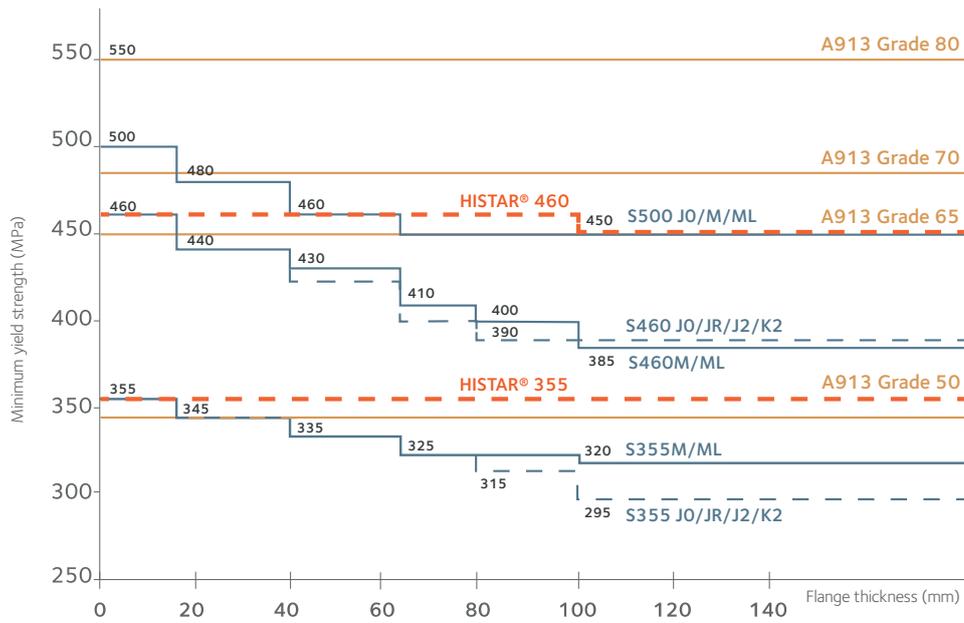
Gatunki stali w odniesieniu do norm EN 10025-2:2019 i EN 10025-4:2019 z ulepszonymi właściwościami na odkształcenie wzdłuż całej grubości elementu, uwzględniające odporność na rozzerwanie lamelarne (klasa jakości Z), dostępne są na indywidualne zamówienie.

Tabela 13 przedstawia listę odpowiadających gatunków stali pomiędzy normami europejskimi, uwzględniając HSTAR®, oraz normami amerykańskimi, kanadyjskimi, japońskimi czy również poprzednimi normami europejskimi.

Stal jest dostarczana z typową zawartością krzemu na poziomie 0,14% do 0,25%, co umożliwia wytworzenie powłoki cynkowej podczas cynkowania zanurzeniowego. Z uwagi na typową zawartość fosforu na docelową grubość powłoki ochronnej wytworzonej dla rozpatrywanego zakresu zawartości krzemu.

Własności mechaniczne profili ArcelorMittal są poprawiane dzięki precyzyjnej kontroli temperatury w trakcie procesu walcowania.

Minimum yield strength according to material thickness



HISTAR® and FRITENAR® trademark steels

The HISTAR® and FRITENAR® trademark steels meet all requirements of the applicable structural steel standards. They exceed the requirements and offer supplementary guarantees.

HISTAR® and FRITENAR® are structural steel grades with a low alloy content, combining high strength, good toughness and superior weldability.

HISTAR® steels are available in yield strengths of 355 MPa and 460 MPa, FRITENAR® steels are available in 355 MPa. The application of the innovative in-line heat treatment QST (Quenching and Self-Tempering) allows all HISTAR® grades, unlike most standard grades, to offer improved guaranteed values for yield strength over the whole product range (see diagram 2).

HISTAR® steels are delivered in a thermo-mechanically rolled condition in accordance with the European Technical Approval ETA-10/0156. They comply with the requirements of the European standards EN 10025-4:2019 for weldable fine grain structural steels.

Aceros HISTAR® y FRITENAR® marcas registradas

Los aceros con marcas registradas HISTAR® y FRITENAR® no sólo cumplen totalmente la normativa aplicable a los aceros estructurales, sino que superan los requisitos de dichas normas a la vez que ofrecen garantías adicionales.

HISTAR® y FRITENAR® son calidades de acero estructural de baja aleación en las que se combinan alta resistencia, buena ductilidad y excelente soldabilidad.

Los aceros HISTAR® están disponibles con unos valores del límite elástico comprendidos entre 355 MPa y 460 MPa, mientras que en el caso de la calidad FRITENAR® este valor es de 355 MPa. A diferencia de lo que se encuentra en la mayoría de las calidades convencionales de construcción, la aplicación del innovador tratamiento térmico QST en línea (Temple y Auto-Revenido) permite garantizar, para todas las calidades HISTAR®, una mejora en los valores del límite elástico para toda su gama de productos (ver diagrama 2).

Los aceros HISTAR® se suministran en el estado de laminación termomecánica de acuerdo a la aprobación técnica Europea ETA-10/0156. Estos son conformes a las especificaciones de las normas europeas EN 10025-4:2019 sobre aceros estructurales soldables de grano fino.

Gatunki stali markowych HISTAR® i FRITENAR®

Gatunki stali markowych HISTAR® i FRITENAR® spełniają wszystkie wymogi norm dla konstrukcji stalowych. Ponadto, gatunki te przewyższają postawione wymagania oraz oferują dodatkowe korzyści.

Gatunki stali HISTAR® i FRITENAR® są gatunkami stali konstrukcyjnej o niskiej zawartości pierwiastków stopowych połączonej z wysoką wytrzymałością, dobrą udarnością oraz doskonałą spawalnością.

Gatunki stali HISTAR® są dostępne z gwarantowaną granicą plastyczności 355 MPa oraz 460 MPa. Gatunek stali FRITENAR® jest dostępny z gwarantowaną granicą plastyczności 355 MPa. Dzięki zastosowaniu innowacyjnej technologii walcowania QST (Quenching and Self-Tempering) stal ta pozwala, w odróżnieniu od większości typowych gatunków stali, na wykorzystanie pełnej gwarantowej granicy plastyczności na całej grubości elementu (patrz schemat 2).

Gatunki stali HISTAR® są dostarczane w stanie walcowania termomechanicznego zgodnym z Europejską Aprobata Techniczną ETA-10/0156. Ponadto, wymogi normy EN 10025-4:2004 dla spawalnych stali drobnokrystalicznych są spełnione.

Table 5 shows the characteristics of the available HISTAR® and FRITENAR® trademark steel grades. Detailed data of these steels are available upon request.

The sections are available in the FRITENAR® grade upon agreement. For HISTAR® grades, only the sizes marked HI in the tables are available.

HISTAR® and FRITENAR® steels can be cut with a torch and machined using the process normally applied to structural steel of the same level of strength. Due to the low carbon equivalent, preheating in order to prevent cracking is generally not necessary for product temperatures >0 °C.

HISTAR® and FRITENAR® steels offer good weldability for manual and automatic processes, provided the general rules for welding are respected. Due to the low carbon equivalent values of these steels, preheating is not necessary within the range of heat inputs of 10-60 kJ/cm and for temperatures of the structure over 0 °C, provided that low hydrogen consumables are used.

Under these conditions, no preheating is required for welding HISTAR® and FRITENAR® steels over the whole thickness range. As for the usual structural steels, drying before welding is recommended for ambient temperatures below 5 °C and when the surface is wet.

If stress relieving is required for HISTAR® and FRITENAR® steels, it is performed at temperatures between 530 °C and 580 °C. The recommended holding time is 2 minutes per mm product thickness, but not less than 30 minutes and not more than 90 minutes.

For a short reheating of the entire thickness of HISTAR® and FRITENAR® beams, the flame straightening temperature should not exceed 650 °C. For local reheating of the surface only, a flame straightening temperature of up to 900 °C is allowable.

La tabla 5 recoge las características de las calidades de aceros disponibles de las marcas registradas HISTAR® y FRITENAR®. Es posible, previa solicitud, disponer de información más detallada sobre estas calidades de acero.

Todos los perfiles están disponibles en la calidad FRITENAR® previa solicitud y acuerdo, mientras que en calidad HISTAR®, sólo están disponibles los perfiles marcados HI.

Los aceros HISTAR® y FRITENAR® pueden ser sometidos a oxicrote y mecanizados mediante el proceso usualmente aplicado a los aceros de igual grado de resistencia. Gracias a su bajo nivel de carbono equivalente, generalmente no es necesario realizar, en aquellos productos cuya temperatura sea >0 °C, un precalentamiento para prevenir la aparición de grietas.

Los aceros HISTAR® y FRITENAR® ofrecen una excelente soldabilidad tanto en procesos automáticos como manuales siempre que se respeten las normas generales para soldaduras. Debido al bajo nivel de carbono equivalente de estos aceros, siempre y cuando se utilicen electrodos con bajo contenido de hidrógeno, no es necesario realizar un calentamiento previo cuando el aporte térmico se sitúe en el rango 10-60 kJ/cm y para temperaturas de la estructura por encima de a 0 °C.

En estas condiciones, es posible soldar toda la gama de espesores de los aceros HISTAR® 355 y FRITENAR® 355 sin recurrir al precalentamiento. Al igual que para los aceros estructurales convencionales, es recomendable secar el material antes de proceder a su soldadura, para temperaturas ambiente por debajo de los 5 °C y cuando la superficie de la pieza esté húmeda.

En caso de que sea necesario eliminar tensiones en los aceros HISTAR® y FRITENAR®, esta operación se realizará a temperaturas comprendidas entre los 530 °C y 580 °C. El tiempo de aplicación recomendado es de 2 minutos por cada mm de espesor, sin que sea en ningún caso inferior a 30 minutos ni superior a 90 minutos.

En caso de que sea necesario realizar un breve recalentamiento en todo el espesor de las vigas HISTAR® y FRITENAR®, conviene que las temperaturas de enderezamiento a la llama no superen los 650 °C, aunque para un recalentamiento localizado en la superficie son admisibles temperaturas de hasta 900 °C.

Charakterystyczne dane dla gatunków stali markowych HISTAR® i FRITENAR® są podane w tabeli 5. Szczegółowa specyfikacja obu gatunków stali jest dostępna na zamówienie.

Profile stalowe w gatunku FRITENAR® dostępne są po uprzednim ustaleniu z wytwórcą. Dostępne profile stalowe w gatunku HISTAR® oznaczone są symbolem HI w tabelach.

Profile stalowe w gatunkach HISTAR® i FRITENAR® mogą być cięte palnikiem oraz obrabiane mechanicznie w identyczny sposób jak typowe stale o tej samej wytrzymałości. Z uwagi na niską wartość równoważnika węglowego, nie ma konieczności stosowania wstępnego podgrzewania stali w celu uniknięcia pęknięcia dla elementów o temperaturze >0 °C.

Gatunki stali HISTAR® i FRITENAR® oferują dobrą spawalność w procesach ręcznego i automatycznego spawania, przy założeniu spełnienia standardowych wymogów spawania. Ze względu na niską wartość równoważnika węglowego wstępne podgrzewanie nie jest wymagane w zakresie dostarczanej energii cieplnej spoiny na poziomie 10-60 kJ/cm, temperatury elementu powyżej 0 °C oraz wykorzystaniu materiałów spawalniczych o niskiej zawartości wodoru.

Z uwagi na powyższe, podczas spawania nie ma konieczności wstępnego podgrzewania stali w gatunkach HISTAR® i FRITENAR® w pełnym zakresie grubości materiału. Tak jak dla typowych gatunków stali, zalecane jest osuszenie powierzchni elementów przed spawaniem w temperaturze otoczenia poniżej 5 °C oraz gdy powierzchnie są mokre.

W przypadku wymogu odprężenia stali dla gatunków HISTAR® i FRITENAR®, zaleca się wykonywanie tej procedury w zakresie temperatur od 530 °C do 580 °C. Zalecany czas odprężania to 2 minuty na każdy mm grubości materiału, lecz nie krócej niż 30 minut oraz nie dłużej niż 90 minut.

W procesie krótkotrwałego ponownego podgrzewania pełnego przekroju profilu w gatunku HISTAR® i FRITENAR®, temperatura podczas prostowania płomieniowego nie powinna przekroczyć 650 °C. W przypadku tylko lokalnego ponownego podgrzewania powierzchni profilu, temperatura do 900 °C jest dopuszczalna.

Steel grades for offshore applications

HISTAR® Offshore and FRITENAR® Offshore are structural steel grades especially developed for offshore applications. In comparison with HISTAR® and FRITENAR® trademark steels, the grades for offshore applications offer the following additional features:

- improved through-thickness deformation – properties with respect to the resistance to lamellar tearing (Z qualities);
- notch impact properties in the transverse direction;
- maximum ratio between yield strength and tensile strength.

The available grades, their mechanical characteristics and chemical composition are shown in tables 6 and 7. The summary table 6 shows the main requirements of EN 10225-2:2019 regarding the mechanical characteristics and the chemical composition of the steel grades.

The HISTAR® and FRITENAR® Offshore grades in Table 7 are in compliance with EN 10225-2:2019.

Detailed data on the HISTAR® Offshore and FRITENAR® Offshore steels are available upon request.

Weathering steel grade Arcorox® according to EN 10025-5 / ASTM A588

Arcorox® structural shapes belong to a family of atmospheric corrosion resistant, low alloy steels for sustainable applications with focus on long service life with low maintenance costs.

By initially forming a natural, tightly adherent, protective oxide layer (patina), it strongly reduces further oxidation and thus supersedes the application of any corrosion protection system.

Calidades de acero para aplicaciones offshore

HISTAR® Offshore y FRITENAR® Offshore son calidades de acero estructural desarrolladas especialmente para aplicaciones offshore. Comparados con los aceros de marcas HISTAR® y FRITENAR® estas calidades offshore presentan las siguientes características adicionales:

- propiedades de deformación mejoradas en el sentido del espesor con respecto a la resistencia al desgarro laminar (calidades Z);
- propiedades de resiliencia garantizadas en sentido transversal;
- relación máxima entre límite elástico y resistencia a la tracción.

En las tablas 6 y 7 se relacionan las calidades disponibles, las características mecánicas y la composición química de estos aceros. La tabla resumen 6 presenta los requisitos principales de la norma 10225-2:2019 en lo que respecta a las características mecánicas y la composición química de las distintas calidades.

Las calidades HISTAR® y FRITENAR® Offshore que aparecen en la tabla 7 son conformes a la norma EN 10225-2:2019.

Previa solicitud se podrá obtener información técnica más detallada sobre los aceros HISTAR® Offshore y FRITENAR® Offshore.

Arcorox® acero autopatinable según EN 10025-5 / ASTM A588

Los perfiles estructurales Arcorox® pertenecen a una familia de aceros de baja aleación resistentes a la corrosión atmosférica destinados a aplicaciones sostenibles enfocadas a una vida útil larga con bajos costos de mantenimiento.

Se forma inicialmente una capa protectora natural de óxido (pátina), fuertemente adherente, que reduce fuertemente la oxidación posterior y por lo tanto sustituye la aplicación de cualquier sistema de protección contra la corrosión.

Gatunki stali dla aplikacji przybrzeżnych

Gatunki stali HISTAR® Offshore oraz FRITENAR® Offshore zostały opracowane specjalnie dla aplikacji w konstrukcjach obiektów przybrzeżnych. W porównaniu ze standardowymi gatunkami markowymi HISTAR® i FRITENAR®, gatunki dla konstrukcji przybrzeżnych oferują dodatkowe zalety:

- zwiększona deformacja na całej grubości elementu wraz zachowaniem wytrzymałości na pękanie lamelarne (klasyfikacja jakości stali Z);
- wysoka udarność w kierunku poprzecznym;
- maksymalny stosunek wartości granicy plastyczności oraz wytrzymałości na rozciąganie.

Dostępne gatunki stali wraz z ich parametrami mechanicznymi oraz kompozycją chemiczną przedstawione są w tabeli 6 oraz 7. Tabela 6 przedstawia zestawienie podstawowych wymagań normy EN 10225-2:2019 odnośnie własności mechanicznych oraz składu chemicznego danych gatunków stali.

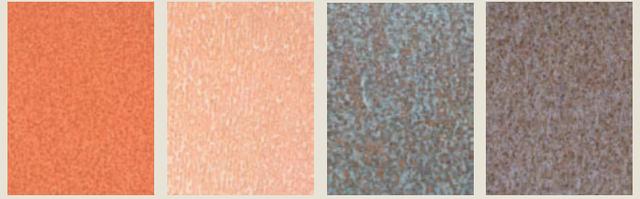
Gatunki stali HISTAR® i FRITENAR® typu Offshore podane w Tabeli 7 są zgodne z normą EN 10225-2:2019.

Szczegółowe dane dotyczące stali HISTAR® Offshore oraz FRITENAR® Offshore dostępne są na zamówienie.

Gatunek stali odporny na warunki atmosferyczne Arcorox® zgodnie z EN 10025-5 / ASTM A588

Kształtowniki konstrukcyjne ze stali Arcorox® należą do rodziny niskostopowych stali odpornych na korozję atmosferyczną odpowiednich do zastosowań energooszczędnych kładących nacisk na długą trwałość użytkową przy równoczesnym niskim koszcie utrzymania.

Poprzez wstępne wytworzenie naturalnej, ściśle przylegającej, ochronnej powłoki tlenkowej (patyna), dalsze utlenianie stali jest znacznie zredukowane i w ten sposób przewyższa stosowanie jakiegokolwiek systemu ochrony antykorozyjnej.



Example of colours for different exposure conditions of steel grade Arcorox®

Therefore, along with aesthetic possibilities, Arcorox® provides durable construction even in the absence of initial painting, which enables savings thanks to:

- reduced cost of maintenance as well as time of maintenance operation;
- no environmental impact due to absence of maintenance operations and residues.

Esthetically Arcorox uniquely suits to each building: Appearance, texture and maturity of the patina depending on time, degree of exposure and atmospheric environment (see example above)

Available sections and minimum order quantity are subject to agreement. Mechanical properties and chemical composition are indicated table 8.

16 Mo3 and P265GH: Steels for elevated service temperatures

Thanks to their improved mechanical properties (specified up to 500 °C) and improved creep resistance, 16 Mo3 & P265GH alloyed steel grades are particularly recommended for use at elevated service temperatures.

Those weldable steel grades are particularly relevant for use in powerplant equipment, exhaust systems, hot machine parts or incineration plants.

Delivery condition and production: Following EN 10025 Part 1 and 2 except chemical and mechanical values. Available sections and minimum order quantity are subject to agreement. Mechanical properties and chemical composition are indicated table 9.

Así, junto con las posibilidades estéticas, Arcorox® permite la construcción de obras duraderas, en ausencia de pintura inicial, lo que permite ahorros gracias a:

- Reducción del coste de mantenimiento al igual que del tiempo de construcción.
- Ningún impacto ambiental debido a la ausencia de operaciones de mantenimiento ni de residuos.

Estéticamente, la utilización de Arcorox® da un toque único y vivo a una edificación: el aspecto, la textura y la madurez de la pátina dependen de las condiciones ambientales, haciendo que el aspecto de la edificación evolucione a través del tiempo y en función del grado de exposición (ver ejemplo arriba).

Los perfiles disponibles y la cantidad mínima de pedido están sujetas a acuerdo previo. Las propiedades mecánicas y la composición química se indican en la tabla 8.

16 Mo3 y P265GH: Aceros aleado para temperaturas de servicio elevadas

Gracias a sus propiedades mecánicas mejoradas (especificadas hasta 500 ° C) y a su resistencia mejorada a la fluencia, el grado de acero aleado 16 Mo3 está especialmente recomendado para su uso a temperaturas de servicio elevadas.

Este grado de acero soldable es de gran relevancia para uso en equipos de centrales eléctricas, conductos de sistemas de escape, partes calientes de maquinaria o plantas de incineración.

Condiciones de producción y suministro según: EN 10025 Parte 1 y 2, excepto los valores químicos y mecánicos. Los perfiles disponibles y el pedido mínimo de pedido están sujetas a un acuerdo previo. Las características mecánicas y la composición química están indicadas en la tabla 9.

Z tego względu, na równi z możliwościami estetycznymi, Arcorox® pozwala na wykonanie trwałych konstrukcji, nawet przy braku malowania podkładowego, co pozwala na oszczędności, dzięki:

- redukcji kosztów utrzymania, a także czasu operacji konserwacyjnych;
- brakowi oddziaływania na środowisko, w związku z brakiem operacji konserwacyjnych i pozostałości.

Pod względem estetycznym, Arcorox® w sposób wyjątkowy nadaje się dla każdego rodzaju budynku: wygląd, tekstura i dojrzałość patyny w zależności od czasu i stopnia wystawienia na działanie czynników atmosferycznych (patrz przykład powyżej).

Dostępne sekcje i minimalna ilość zamówienia podlegają uzgodnieniu. Własności wytrzymałościowe oraz skład chemiczny podane są w tabeli 8.

16 Mo3 i P265GH: Stal odpowiednia dla podwyższonej temperatury roboczej

Dzięki swoim ulepszonym własnościom wytrzymałościowym (określonym do 500 °C) oraz poprawionej odporności na pęczanie, stal stopowa w gatunkach 16Mo3 i P265GH jest szczególnie zalecana do stosowania w podwyższonych temperaturach eksploatacyjnych. Ten gatunek stali spawalnej szczególnie nadaje się do stosowania w wyposażeniu elektrowni, systemach wylotowych, gorących częściach maszyn lub spalarniach.

Stan dostawy i produkcja: Zgodnie z EN 10025 część 1 i 2, z wyjątkiem wartości chemicznych i mechanicznych. Dostępne przekroje i minimalna ilość zamówienia podlegają uzgodnieniu. Własności wytrzymałościowe i skład chemiczny podane są w tabeli 9.

Table 1 Usual structural steel grade designations

according to EN 10027-1:2017, EN 10025-2:2019, EN 10025-4:2019

Tabla 1 Designaciones habituales de las calidades de acero estructural

conforme a EN 10027-1:2017, EN 10025-2:2019, EN 10025-4:2019

Tabela 1 Typowe oznaczenia klasy i gatunku stali konstrukcyjnej

zgodne z EN 10027-1:2017, EN 10025-2:2019, EN 10025-4:2019

| Steel group Grupo acero Grupa stali | |
|---|---|
| S | structural steel / acero estructural / stal konstrukcyjna |

| Mechanical characteristics Características mecánicas Charakterystyka mechaniczna | |
|--|---|
| XXX | min. yield strength in MPa límite elástico mín. en Mpa min. granica plastyczności w MPa |

| Treatment conditions Condiciones de tratamiento Warunki obróbki | |
|---|---|
| +M | thermomechanical rolling laminación termomecánica walcowanie termomechaniczne |
| +N | normalised rolling laminación normalizada walcowanie normalizujące |
| +AR | as rolled como laminado jak walcowane |

(example / ejemplo / przykład)

EN 10025-2:2019 S 355 J2 + Z35 +M

| Mechanical characteristics - group 1 Características mecánicas - grupo 1 Charakterystyka mechaniczna - grupa 1 | | |
|--|-----------|----------|
| notch toughness / tenacidad a la entalla / udarność | | |
| min. 27 J | min. 40 J | Temp. °C |
| JR | - | 20 |
| JO | - | 0 |
| J2 | K2 | -20 |

| Special requirements Requisitos especiales Specjalne wymagania | |
|--|--|
| Z 15 | min. 15% reduction of area min. Reducción del 15% del área. min. 15% redukcja pola przekroju |
| Z 25 | min. 25% reduction of area min. Reducción del 25% del área. min. 25% redukcja pola przekroju |
| Z35 | min. 35% reduction of area min. Reducción del 35% del área. min. 35% redukcja pola przekroju |

| Physical characteristics - group 2 Características físicas - grupo 2 Charakterystyka fizyczna - grupa 2 | |
|---|---|
| L | for low temperatures para bajas temperaturas dla niskich temperatur |
| M | thermomechanical rolling laminación termomecánica walcowane termomechanicznie |
| N | normalised rolling laminación normalizada walcowane normalizujące |
| W | weathering / patinable / odporna na warunki atmosferyczne |

(example / ejemplo / przykład) **EN 10025-4:2019 S 355 ML**

Table 2
Non-alloy structural steels according to European standard

Tabla 2
Aceros estructurales no aleados según norma europea

Tabela 2
Niestopowa stal konstrukcyjna zgodna z normą europejską

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínimo Minimalna granica plastyczności R_{eH} , MPa | | | | | | Tensile strength Resistencia a la tracción Wytrzymałość na rozciąganie R_m , MPa | | Minimum elongation Alargamiento mínimo Minimalna ciągliwość $L_0 = 5,65 \cdot \sqrt{S_0}$ A, % | | | | Notch impact test, longitudinal Ensayo de flexión por choque, longitudinal Próba udarowości z korbem V, en long | |
|----------------------------|--------------------------------|---|------------|------------|------------|-------------|--------------|---|--------------|--|------------|-------------|--------------|---|--|
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | Temperature Temperatura Temperatura | Min. absorbed energy ¹⁾ Min. absorbed energy ¹⁾ Min. zaabsorbowana energia ¹⁾ |
| | | ≤16 | >16 ≤40 | >40 ≤63 | >63 ≤80 | >80 ≤100 | >100 ≤140 | ≥3 ≤100 | >100 ≤140 | ≥3 ≤40 | >40 ≤63 | >63 ≤100 | >100 ≤140 | °C | J |

| | | | | | | | | | | | | | | | |
|-----------------|----------|-----|-----|-----|-----|-----|-----|---------|---------|----|----|----|----|-----|----|
| EN 10025-2:2019 | S235JR | 235 | 225 | 215 | | | 195 | 360-510 | 350-500 | 26 | 25 | 24 | 22 | +20 | 27 |
| | S235J0 | 235 | 225 | 215 | | | 195 | 360-510 | 350-500 | 26 | 25 | 24 | 22 | 0 | 27 |
| | S235J2 ☞ | 235 | 225 | 215 | | | 195 | 360-510 | 350-500 | 26 | 25 | 24 | 22 | -20 | 27 |
| | S275JR | 275 | 265 | 255 | 245 | 235 | 225 | 410-560 | 400-540 | 23 | 22 | 21 | 19 | +20 | 27 |
| | S275J0 | 275 | 265 | 255 | 245 | 235 | 225 | 410-560 | 400-540 | 23 | 22 | 21 | 19 | 0 | 27 |
| | S275J2 ☞ | 275 | 265 | 255 | 245 | 235 | 225 | 410-560 | 400-540 | 23 | 22 | 21 | 19 | -20 | 27 |
| | S355JR | 355 | 345 | 335 | 325 | 315 | 295 | 470-630 | 450-600 | 22 | 21 | 20 | 18 | +20 | 27 |
| | S355J0 | 355 | 345 | 335 | 325 | 315 | 295 | 470-630 | 450-600 | 22 | 21 | 20 | 18 | 0 | 27 |
| | S355J2 | 355 | 345 | 335 | 325 | 315 | 295 | 470-630 | 450-600 | 22 | 21 | 20 | 18 | -20 | 27 |
| | S355K2 | 355 | 345 | 335 | 325 | 315 | 295 | 470-630 | 450-600 | 22 | 21 | 20 | 18 | -20 | 40 |
| | S460JR ☞ | 460 | 440 | 420 | 400 | 390 | 390 | 550-720 | 530-700 | 17 | 17 | 17 | 17 | +20 | 27 |
| | S460J0 ☞ | 460 | 440 | 420 | 400 | 390 | 390 | 550-720 | 530-700 | 17 | 17 | 17 | 17 | 0 | 27 |
| | S460J2 ☞ | 460 | 440 | 420 | 400 | 390 | 390 | 550-720 | 530-700 | 17 | 17 | 17 | 17 | -20 | 27 |
| | S460K2 ☞ | 460 | 440 | 420 | 400 | 390 | 390 | 550-720 | 530-700 | 17 | 17 | 17 | 17 | -20 | 40 |
| | S500J0 ☞ | 500 | 480 | 460 | 450 | 450 | 450 | 580-760 | 560-750 | 15 | 15 | 15 | 15 | 0 | 27 |

¹⁾ For sections with a nominal thickness >100 mm the values shall be agreed.

¹⁾ Se deben acordar los valores para perfiles con espesores nominales >100 mm.

¹⁾ Dla profili o grubości nominalnej >100mm w/w wartości należy uzgodnić.

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Ladle analysis Análisis de colada Analiza wytopu | | | | | | | | | | | CEV ⁴⁾ max. % | | |
|----------------------------|--------------------------------|--|--------------------|-------------------|-----------------|-------------------------------|---------------------|----------------|------------------------------|-----------------|--|--|--------------------------------|-------------|--|
| | | C max. % | | | Mn max. % | Si ⁶⁾ max. % | P max. % | S max. % | N ²⁾ max. % | Cu max. % | Other ⁷⁾ Othos ⁷⁾ Pozostałe ⁷⁾ max. % | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | |
| | | ≤ 16 | >16 ≤40 | >40 ³⁾ | | | | | | | | ≤30 | >30 ≤40 | >40 ≤140 | |
| | | | | | | | | | | | | | | | |
| EN 10025-2:2019 | S235JR | 0,17 | 0,17 | 0,20 | 1,40 | - | 0,040 ⁵⁾ | 0,040 | 0,012 | 0,55 | - | 0,35 | 0,35 | 0,38 | |
| | S235J0 | 0,17 | 0,17 | 0,17 | 1,40 | - | 0,035 | 0,035 | 0,012 | 0,55 | - | 0,35 | 0,35 | 0,38 | |
| | S235J2 ⁵⁾ | 0,17 | 0,17 | 0,17 | 1,40 | - | 0,030 | 0,030 | - | 0,55 | - | 0,35 | 0,35 | 0,38 | |
| | S275JR | 0,21 | 0,21 | 0,22 | 1,50 | - | 0,040 ⁵⁾ | 0,040 | 0,012 | 0,55 | - | 0,40 | 0,40 | 0,42 | |
| | S275J0 | 0,18 | 0,18 | 0,18 | 1,50 | - | 0,035 | 0,035 | 0,012 | 0,55 | - | 0,40 | 0,40 | 0,42 | |
| | S275J2 ⁵⁾ | 0,18 | 0,18 | 0,18 | 1,50 | - | 0,030 | 0,030 | - | 0,55 | - | 0,40 | 0,40 | 0,42 | |
| | S355JR | 0,24 | 0,24 | 0,24 | 1,60 | 0,55 | 0,040 ⁵⁾ | 0,040 | 0,012 | 0,55 | - | 0,45 | 0,47 | 0,47 | |
| | S355J0 | 0,20 | 0,20 ¹⁾ | 0,22 | 1,60 | 0,55 | 0,035 | 0,035 | 0,012 | 0,55 | - | 0,45 | 0,47 | 0,47 | |
| | S355J2 ⁵⁾ | 0,20 | 0,20 ¹⁾ | 0,22 | 1,60 | 0,55 | 0,030 | 0,030 | - | 0,55 | - | 0,45 | 0,47 | 0,47 | |
| | S355K2 ⁵⁾ | 0,20 | 0,20 ¹⁾ | 0,22 | 1,60 | 0,55 | 0,030 | 0,030 | - | 0,55 | - | 0,45 | 0,47 | 0,47 | |
| | S460JR ⁵⁾ | 0,20 | 0,20 ¹⁾ | 0,22 | 1,70 | 0,55 | 0,035 | 0,035 | 0,025 | 0,55 | 8) | 0,47 | 0,49 | 0,49 | |
| | S460J0 ⁵⁾ | 0,20 | 0,20 ¹⁾ | 0,22 | 1,70 | 0,55 | 0,035 | 0,035 | 0,025 | 0,55 | 8) | 0,47 | 0,49 | 0,49 | |
| | S460J2 ⁵⁾ | 0,20 | 0,20 ¹⁾ | 0,22 | 1,70 | 0,55 | 0,035 | 0,035 | 0,025 | 0,55 | 8) | 0,47 | 0,49 | 0,49 | |
| | S460K2 ⁵⁾ | 0,20 | 0,20 ¹⁾ | 0,22 | 1,70 | 0,55 | 0,035 | 0,035 | 0,025 | 0,55 | 8) | 0,47 | 0,49 | 0,49 | |
| | S500J0 ⁵⁾ | 0,20 | 0,20 | 0,22 | 1,70 | 0,55 | 0,035 | 0,035 | 0,025 | 0,55 | 8) | 0,49 | 0,49 | 0,49 | |

¹⁾ For nominal thickness >30 mm: C = 0,22% max.

²⁾ The max. value for nitrogen does not apply if the chemical composition shows a minimum total Al content of 0,020% or if sufficient other N binding elements are present. The N binding elements shall be mentioned in the inspection document.

³⁾ For nominal thickness >100 mm: C content upon agreement.

⁴⁾ CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15; see § 7.2.5 of EN 10025-2:2019 concerning special requirements for S275 and S355.

⁵⁾ Fully killed steel containing nitrogen binding element in amounts sufficient to bind the available nitrogen (for example min. 0,02% Al). If other elements are used they shall be reported in the inspection document.

⁶⁾ Upon agreement: Si = 0,14 - 0,25% and P ≤ 0,035% max. for capability of forming a zinc layer during hot-dip galvanisation (Category B).

⁷⁾ If other elements are added, they shall be mentioned in the inspection document.

⁸⁾ The steel may show a Nb content of max. 0,05%, a V content of max. 0,13% and a Ti content of max. 0,05%.

¹⁾ Para espesores nominales >30 mm: C = 0,22% máx.

²⁾ El valor máx. exigido para el nitrógeno no se aplica cuando la composición química presenta un contenido mínimo de Al total del 0,020% o cuando existe una cantidad suficiente de otros elementos que fijan el N. Los elementos que fijan el nitrógeno deben estar mencionados en el documento de control.

³⁾ Para espesores nominales >100 mm: contenido de C según acuerdo.

⁴⁾ CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15; véase § 7.2.5 de la norma EN 10025-2:2019 relativa a las condiciones especiales para S275 y S355.

⁵⁾ Acero totalmente calmado con presencia de elementos que fijan el nitrógeno en cantidades suficientes para fijar el nitrógeno presente (por ejemplo mín. 0,02 % Al).

En caso de utilizar otros elementos estos deberán mencionarse en el documento de control.

⁶⁾ Previo acuerdo: Si = 0,14 - 0,25% y P ≤ 0,035% máx. para la capacidad de formar una capa de zinc durante la galvanización por inmersión en baño caliente (categoría B).

⁷⁾ Si se añaden más elementos, deberán ser consignados en el documento de control.

⁸⁾ Los contenidos máximos que puede presentar el acero son 0,05% de Nb, 0,13% de V y 0,05% de Ti.

¹⁾ Dla grubości nominalnych >30 mm: C = 0,22% max.

²⁾ Maksymalna zawartość azotu nie ma zastosowania jeśli skład chemiczny wykazuje minimalną zawartość aluminium 0.020% lub jeśli wystarczające pierwiastki wiążące azot są obecne. Pierwiastki wiążące azot powinny być wymienione w dokumentacji kontrolnej.

³⁾ Dla grubości nominalnych >100 mm: zawartość węgla jest do uzgodnienia.

⁴⁾ CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15; zobacz § 7.2.5 normy EN 10025-2:2019 dotyczącego specjalnych wymagań dla S275 i S355.

⁵⁾ Stal całkowicie uspokojona zawierająca pierwiastki wiążące azot w ilościach wystarczających do związania azotu (np. AL min 0,02%).

Jeśli inne pierwiastki zostały użyte, powinny być wymienione w dokumentacji kontrolnej.

⁶⁾ Po uzgodnieniu: Si = 0,14 - 0,25% i P ≤ 0,035% max. aby wytworzenie warstwy cynku podczas cynkowania zanurzeniowego na gorąco (klasa 3) było możliwe.

⁷⁾ Jeśli inne pierwiastki zostały dodane, powinny być wymienione w dokumentacji kontrolnej.

⁸⁾ Stal może wykazywać zawartość Nb max 0,05%, zawartość V max 0,13% i zawartość Ti max 0,05%.

Table 3

Weldable fine grain structural steels according to European standard

Tabla 3

Aceros estructurales soldables de grano fino según norma europea

Tabela 3

Spawalne stale konstrukcyjne drobnoziarniste według norm europejskich

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínimo Minimalna granica plastyczności R_{eH} , MPa | | | | | | | Tensile strength Resistencia a la tracción Wytrzymałość na rozciąganie R_m , MPa | | | | | | | Minimum elongation, Alargamiento mínimo, Minimalne wydłużenie $L_0 = 5,65 \cdot \sqrt{S_0}$ A, % | Notch impact test, longitudinal Ensayo de flexión por choque, longitudinal Próba udarności z karbem V, en long | |
|----------------------------|--------------------------------|---|------------|------------|------------|-------------|--------------|--------------|---|------------|------------|-------------|--------------|--------------|----|--|--|--|
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | | | Temp. | Min. absorbed energy Energía mín. absorbida Min. zaabsorbowana energia |
| | | ≤16 | >16 ≤40 | >40 ≤63 | >63 ≤80 | >80 ≤100 | >100 ≤125 | >125 ≤140 | ≤40 | >40 ≤63 | >63 ≤80 | >80 ≤100 | >100 ≤125 | >125 ≤140 | °C | J | | |

| EN10025-4:2019 | S275M | 275 | 265 | 255 | 245 | 245 | 240 | 240 | 370-530 | 360-520 | 350-510 | 350-510 | 350-510 | 350-510 | 24 | -20 | 40 |
|----------------|--------|-----|-----|-----|-----|-----|-----|-----|---------|---------|---------|---------|---------|---------|----|-----|----|
| | S275ML | 275 | 265 | 255 | 245 | 245 | 240 | 240 | 370-530 | 360-520 | 350-510 | 350-510 | 350-510 | 350-510 | 24 | -50 | 27 |
| | S355M | 355 | 345 | 335 | 325 | 325 | 320 | 320 | 470-630 | 450-610 | 440-600 | 440-600 | 430-590 | 430-590 | 22 | -20 | 40 |
| | S355ML | 355 | 345 | 335 | 325 | 325 | 320 | - | 470-630 | 450-610 | 440-600 | 440-600 | 430-590 | - | 22 | -50 | 27 |
| | S420M | 420 | 400 | 390 | 380 | 370 | 365 | 365 | 520-680 | 500-660 | 480-640 | 470-630 | 460-620 | 460-620 | 19 | -20 | 40 |
| | S420ML | 420 | 400 | 390 | 380 | 370 | 365 | - | 520-680 | 500-660 | 480-640 | 470-630 | 460-620 | - | 19 | -50 | 27 |
| | S460M | 460 | 440 | 430 | 410 | 400 | 385 | 385 | 540-720 | 530-710 | 510-690 | 500-680 | 490-660 | 490-660 | 17 | -20 | 40 |
| | S460ML | 460 | 440 | 430 | 410 | 400 | 385 | - | 540-720 | 530-710 | 510-690 | 500-680 | 490-660 | - | 17 | -50 | 27 |
| | S500M | 500 | 480 | 460 | 450 | 450 | 450 | 450 | 580-760 | 580-760 | 580-760 | 560-750 | 560-750 | 560-750 | 15 | -20 | 40 |
| | S550ML | 500 | 480 | 460 | 450 | 450 | 450 | - | 580-760 | 580-760 | 580-760 | 560-750 | 560-750 | 560-750 | 15 | -50 | 27 |

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Ladle analysis Análisis de colada Analiza próbki pobranej z kadzi | | | | | | | | | | | | | | CEV ²⁾ max. % | | | |
|----------------------------|--------------------------------|---|-----------------|-------------------------------|----------------|----------------|--|-----------------|----------------|-----------------|-----------------|-------------------------------|-----------------|-----------------|----------------|--|------------|------------|-------------|
| | | C max. % | Mn max. % | Si ³⁾ max. % | P max. % | S max. % | Al ¹⁾ total min. % | Nb max. % | V max. % | Ti max. % | Cr max. % | Mo max. % ²⁾ | Ni max. % | Cu max. % | N max. % | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | |
| | | | | | | | | | | | | | | | | ≤16 | >16 ≤40 | >40 ≤63 | >63 ≤140 |
| | | | | | | | | | | | | | | | | | | | |

| EN10025-4:2004 | S275M | 0,15 | 1,50 | 0,50 | 0,035 | 0,030 | 0,02 | 0,05 | 0,08 | 0,05 | 0,30 | 0,10 | 0,30 | 0,55 | 0,015 | 0,34 | 0,34 | 0,35 | 0,38 |
|----------------|--------|------|------|-------|-------|-------|-------|------|------|------|------|------|------|-------|-------|------|------|------|------|
| | S275ML | 0,15 | 1,50 | 0,50 | 0,035 | 0,030 | 0,02 | 0,05 | 0,08 | 0,05 | 0,30 | 0,10 | 0,30 | 0,55 | 0,015 | 0,34 | 0,34 | 0,35 | 0,38 |
| | S355M | 0,16 | 1,60 | 0,50 | 0,035 | 0,030 | 0,02 | 0,05 | 0,10 | 0,05 | 0,30 | 0,10 | 0,50 | 0,55 | 0,015 | 0,39 | 0,39 | 0,40 | 0,45 |
| | S355ML | 0,16 | 1,60 | 0,50 | 0,035 | 0,030 | 0,02 | 0,05 | 0,10 | 0,05 | 0,30 | 0,10 | 0,50 | 0,55 | 0,015 | 0,39 | 0,39 | 0,40 | 0,45 |
| | S420M | 0,18 | 1,70 | 0,50 | 0,035 | 0,030 | 0,02 | 0,05 | 0,12 | 0,05 | 0,30 | 0,20 | 0,80 | 0,55 | 0,025 | 0,43 | 0,45 | 0,46 | 0,47 |
| | S420ML | 0,18 | 1,70 | 0,50 | 0,035 | 0,030 | 0,02 | 0,05 | 0,12 | 0,05 | 0,30 | 0,20 | 0,80 | 0,55 | 0,025 | 0,43 | 0,45 | 0,46 | 0,47 |
| | S460M | 0,18 | 1,70 | 0,60 | 0,035 | 0,030 | 0,02 | 0,05 | 0,12 | 0,05 | 0,30 | 0,20 | 0,80 | 0,55 | 0,025 | 0,45 | 0,46 | 0,47 | 0,48 |
| | S460ML | 0,18 | 1,70 | 0,60 | 0,030 | 0,025 | 0,02 | 0,05 | 0,12 | 0,05 | 0,30 | 0,20 | 0,80 | 0,55 | 0,025 | 0,45 | 0,46 | 0,47 | 0,48 |
| | S500M | 0,16 | 1,70 | 0,60 | 0,035 | 0,030 | 0,020 | 0,05 | 0,12 | 0,05 | 0,30 | 0,20 | 0,80 | 0,55 | 0,025 | 0,47 | 0,47 | 0,47 | 0,48 |
| S550ML | 0,16 | 1,70 | 0,60 | 0,030 | 0,025 | 0,020 | 0,05 | 0,12 | 0,05 | 0,30 | 0,20 | 0,80 | 0,55 | 0,025 | 0,47 | 0,47 | 0,47 | 0,48 | |

¹⁾ If sufficient other nitrogen binding elements are present, the minimum aluminium requirement does not apply.

²⁾ $CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15$; see § 7.2.4 of EN 10025-4:2019 concerning special requirements.

³⁾ Upon agreement: Si = 0,14 - 0,25% and P ≤ 0,035% max. for capability of forming a zinc layer during hot-dip galvanisation (Category B).

¹⁾ Cuando estén presentes elementos que fijan el nitrógeno en cantidad suficiente, el requisito de contenido mínimo de aluminio no es aplicable.

²⁾ $CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15$; véase § 7.2.4 de la norma EN 10025-2:2019 relativa a las condiciones especiales.

³⁾ Previo acuerdo: Si = 0,14 - 0,25% y P ≤ 0,035% máx. para la capacidad de formar una capa de zinc durante la galvanización por inmersión en baño caliente (categoría B).

¹⁾ Jeśli pierwiastki wiążące azot są obecne, wartość minimalna aluminium nie ma zastosowania.

²⁾ $CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15$; zob. § 7.2.4 normy EN 10025-2:2004 dotyczący specjalnych wymagań.

³⁾ Po uzgodnieniu: Si = 0,14; 0,25% i P ≤ 0,035% max. Aby było możliwe wytworzenie warstwy cynku podczas cynkowania zanurzeniowego na gorąco (Kategoria B.).

Table 4

Steels for quenching and tempering - non-alloy quality steels and non-alloy special steels

Tabla 4

Aceros para temple y revenido - aceros no aleados de alta calidad y aceros especiales no aleados

Tabela 4

Stal do ulepszania cieplnego - niestopowa stal jakościowa i specjalna

Mechanical properties (normalised condition) / Propiedades mecánicas (condición normalizada) / Właściwości mechaniczne (warunek znormalizowany)

| Standard Norma | | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínim Minimalna granica plastyczności R _{eH} , MPa | | Minimum tensile strength Límite elástico mínim Minimalna granica plastyczności R _m , MPa | | Minimum elongation Alargamiento mínimo Minimalna ciągliwość $L_0 = 5,65 \cdot \sqrt{S_0}$ A, % | | | |
|--------------------------|----------------------------------|--------------------------------|--|---------------|---|---------------|--|---------------|--------------|---------------|
| | | | Size (a) Dimensiones (a) Wymiary (a) | | | | | | 16 < a ≤ 100 | 100 < a ≤ 250 |
| | | | 16 < a ≤ 100 | 100 < a ≤ 250 | 16 < a ≤ 100 | 100 < a ≤ 250 | 16 < a ≤ 100 | 100 < a ≤ 250 | | |
| EN ISO 683-1: 2018 | special steel | C45E | 305 | 275 | 580 | 560 | 16 | 16 | | |
| | acero especial stal specjalna | C45R | 305 | 275 | 580 | 560 | 16 | 16 | | |

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | | Grades Calidades Gatunki | Ladle analysis Análisis de colada Analiza wytopu | | | | | | | | | | |
|----------------------------|--|--------------------------------|--|-------------|-----------------|----------------|-----------------|------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------------|
| | | | C % | Mn % | Si max. % | P max. % | Si max. % | S max./ min.-max. % | Cr max. % | Cu max. % | Mo max. % | Ni max. % | Cr+Mo+Ni max. % |
| EN ISO 683-1: 2018 | special steel acero especial stal specjalna | C45E | 0,42 - 0,50 | 0,50 - 0,80 | 0,10 - 0,40 | 0,025 | 0,035 | 0,035 | 0,40 | 0,30 | 0,10 | 0,40 | 0,63 |
| | | C45R | 0,42 - 0,50 | 0,50 - 0,80 | 0,10 - 0,40 | 0,025 | 0,020-0,040 | 0,02-0,04 | 0,40 | 0,30 | 0,10 | 0,40 | 0,63 |

Table 5
HISTAR® and FRITENAR® Trademark Steels

Tabla 5
Aceros HISTAR® y FRITENAR® - marcas registradas

Tabela 5
Stale markowe HISTAR® i FRITENAR®

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Norme Standard Norma | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínimo Minimalna granica plastyczności R_{eH} , MPa | | | | | Tensile strength Resistencia a la tracción Wytrzymałość na rozciąganie R_m , MPa | Minimum elongation Alargamiento mínimo Minimalna ciągliwość $L_0 = 5,65 \cdot \sqrt{S_0}$ A, % | Notch impact test longitudinal ¹⁾ Ensayo de flexión por choque ¹⁾ Próba udarowości z karbem V, en long ¹⁾ | |
|----------------------|--------------------------|---|------------|-------------|--------------|--------------|---|--|---|--|
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | | Temperature Temperatura Temperatura | Min. absorbed energy Energía mín. absorbida Min. zaabsorbowana energia |
| | | ≤16 | >16 ≤40 | >40 ≤100 | >100 ≤125 | >125 ≤140 | | | °C | J |

| | | | | | | | | | | |
|------------------------|---------------|-----|-----|-----|---|---|---------|----|------------|----------|
| ETA 10/0156 | HISTAR® 355 | 355 | | | | | 470-630 | 22 | -20 | 40 |
| | HISTAR® 355 L | 355 | | | - | | 470-630 | 22 | -20 -50 | 47 27 |
| | HISTAR® 460 | 460 | | 450 | | | 540-720 | 17 | -20 | 40 |
| | HISTAR® 460 L | 460 | | 450 | | - | 540-720 | 17 | -20 -50 | 47 27 |
| ArcelorMittal Standard | FRITENAR® 355 | 355 | 345 | - | - | - | 470-630 | 22 | -20 | 40 |

¹⁾ Mean value of 3 tests for full size specimens with no single value less than 70% of the guaranteed average value. The provisions according to EN 10025-1:2004 are applicable.

¹⁾ Valor medio de 3 ensayos en probetas sin reducir, sin que ninguno de sus valores sea inferior al 70% del valor medio garantizado. Son aplicables las especificaciones de la norma EN 10025-1:2004.

¹⁾ Średnia wartość z 3 testów dla próbek o pełnych rozmiarach, gdzie żadna wartość nie niższa niż 70% gwarantowanej średniej wartości. Zgodność z wytycznymi normy EN 10025-1:2004.

Chemical composition / Composición química / Skład chemiczny

| Norme Standard Norma | Grades Calidades Gatunki | Ladle analysis ⁴⁾ Análisis de colada ⁴⁾ Analiza próbki pobranej z kadzi ⁴⁾ | | | | | | | | | | | | | CEV ¹⁾ max. % | | | |
|----------------------|--------------------------|---|-----------|-------------------------|----------|----------|-------------------------|-----------|-----------|-----------|-----------|-----------|----------|--|--------------------------------|-------------|--------------|--------------|
| | | C max. % | Mn max. % | Si ³⁾ max. % | P max. % | S max. % | Al ²⁾ min. % | Cr max. % | Ni max. % | Mo max. % | Nb max. % | Ti max. % | V max. % | Nominal thickness (mm) Espesor nominal (mm) Nominalna grubość (mm) | | | | |
| | | | | | | | | | | | | | | | ≤63 | >63 ≤100 | >100 ≤125 | >125 ≤140 |
| | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|------------------------|---------------|------|------|------|-------|-------|------|------|------|------|------|------|------|------------------|------|------|------|
| ETA 10/0156 | HISTAR® 355 | 0,12 | 1,60 | 0,50 | 0,030 | 0,030 | 0,02 | 0,30 | 0,30 | 0,20 | 0,05 | 0,05 | 0,10 | 0,39 | 0,39 | 0,39 | 0,39 |
| | HISTAR® 355 L | 0,12 | 1,60 | 0,50 | 0,030 | 0,025 | 0,02 | 0,30 | 0,30 | 0,20 | 0,05 | 0,05 | 0,10 | 0,39 | 0,39 | 0,39 | - |
| | HISTAR® 460 | 0,12 | 1,70 | 0,60 | 0,030 | 0,030 | 0,02 | 0,30 | 0,70 | 0,20 | 0,05 | 0,05 | 0,12 | 0,41 | 0,43 | 0,43 | 0,43 |
| | HISTAR® 460 L | 0,12 | 1,70 | 0,60 | 0,030 | 0,025 | 0,02 | 0,30 | 0,70 | 0,20 | 0,05 | 0,05 | 0,12 | 0,41 | 0,43 | 0,43 | - |
| ArcelorMittal Standard | FRITENAR® 355 | 0,14 | 1,60 | 0,55 | 0,030 | 0,030 | 0,02 | - | - | - | 0,05 | - | 0,06 | 0,40 (≤40 mm) | - | - | - |

¹⁾ CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

²⁾ If sufficient nitrogen binding elements are present, the minimum aluminium requirement does not apply.

³⁾ Upon agreement: Si = 0,14 - 0,25% and P ≤ 0,035% max. for capability of forming a zinc layer during hot-dip galvanisation.

⁴⁾ Other elements are limited as per provisions of ETA-10/0156.

¹⁾ CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

²⁾ Cuando estén presentes elementos que fijan el nitrógeno en cantidad suficiente, el requisito de contenido mínimo de aluminio no es aplicable.

³⁾ Previo acuerdo: Si = 0,14 - 0,25% y P ≤ 0,035% máx. para la capacidad de formar una capa de zinc durante la galvanización por inmersión en baño caliente.

⁴⁾ Otros elementos están limitados según se establece en ETA-10/0156.

¹⁾ CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

²⁾ Jeśli wystarczająca ilość pierwiastków wiążących azot jest obecna, wymóg odnośnie minimalnej zawartości aluminium nie ma zastosowania.

³⁾ Po uzgodnieniu: Si = 0,14 - 0,25% i P ≤ 0,035% max. aby wytworzenie warstwy cynku podczas cynkowania zanurzeniowego na gorąco było możliwe.

⁴⁾ Występowanie innych pierwiastków jest ograniczone wg dyrektyw ETA-10/0156.

Table 6 Weldable structural steels for fixed offshore structures according to European standard

Tabla 6 Tabla 6 Aceros estructurales soldables para estructuras fijas offshore según norma europea

Tabela 6 Spawalna stal konstrukcyjna do zastosowań nieruchomych konstrukcji przybrzeżno-morskich zgodnie z normą europejską

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínimo Minimalna granica plastyczności R_{eH} , MPa | | | | Tensile strength Resistencia a la tracción Wytrzymałość na rozciąganie R_m , MP a | Minimum elongation Alargamiento mínimo Minimalna ciągliwość $L_0 = 5,65 * \sqrt{S_0}$ A, % | Notch impact test Ensayo de flexión Test udarności na karb | | | |
|----------------------------|--------------------------------|---|--|---------------------|--|--|--|--|---|--|---|
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | en long en largo długo | | transverse transverso poprzeczny | |
| | | T° | Min. absorbed energy Energía mín. absorbida Min. zaabsorbowana energia | T° | Min. absorbed energy Energía mín. absorbida Min. zaabsorbowana energia | | | | | | |
| | | ≤ 16 | > 16 ≤ 25 | > 25 ≤ 40 | R_e/R_m max. | | | $^\circ C$ | J | $^\circ C$ | J |

| | | | | | | | | | | | |
|-----------------|----------|-----|-----|-----|------|---------|----|-----|----|-----|----|
| EN 10225-2:2019 | S355MO | 355 | 345 | 345 | 0,87 | 450-610 | 22 | -20 | 50 | -20 | 50 |
| | S355MLO | 355 | 355 | 345 | 0,87 | 470-630 | 22 | -40 | 50 | | |
| | S355ML10 | 355 | 355 | 345 | 0,87 | 470-630 | 22 | | | -40 | 50 |
| | S420MLO | 420 | 400 | 390 | 0,90 | 500-660 | 19 | -40 | 50 | | |
| | S420ML10 | 420 | 400 | 390 | 0,90 | 500-660 | 19 | | | -40 | 50 |
| | S460MLO | 460 | 440 | 420 | 0,90 | 520-700 | 17 | -40 | 50 | | |
| | S460ML10 | 460 | 440 | 420 | 0,90 | 520-700 | 17 | | | -40 | 50 |

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Ladle and product analysis ²⁾ Análisis de reparto y producto ²⁾ Analiza odlewów i produktów ²⁾ | | | | | | | | | | | | | | | | |
|----------------------|--------------------------|---|-------------------------|-----------|----------|----------|-----------|-----------|-----------|----------------------------|-----------|----------|-----------|-----------|----------|-----------------------|--------------|------------------|
| | | C max. % | Si ³⁾ max. % | Mn max. % | S max. % | P max. % | Cr max. % | Mo max. % | Ni max. % | Al ¹⁾ (Total) % | Cu max. % | N max. % | Nb max. % | Ti max. % | V max. % | Cr +Mo +Ni +Cu max. % | Nb +V max. % | Nb +V +Ti max. % |

| | | | | | | | | | | | | | | | | | | | |
|-----------------|------------------------|------|------|------|-------|-------|------|------|------|-------------|------|-------|-------|-------|-------|------|------|------|------|
| EN 10225-2:2019 | S355MO | 0,16 | 0,50 | 0,60 | 0,030 | 0,035 | - | 0,20 | 0,30 | 0,015-0,055 | 0,35 | 0,015 | 0,050 | 0,050 | 0,100 | - | - | - | 0,43 |
| | S355MLO | 0,14 | 0,55 | 1,65 | 0,015 | 0,025 | 0,25 | 0,08 | 0,70 | 0,015-0,055 | 0,30 | 0,012 | 0,050 | 0,025 | 0,060 | 0,80 | 0,06 | 0,08 | 0,43 |
| | S355ML10 | 0,14 | 0,55 | 1,65 | 0,007 | 0,020 | 0,25 | 0,08 | 0,70 | 0,015-0,055 | 0,30 | 0,012 | 0,050 | 0,025 | 0,060 | 0,80 | 0,06 | 0,08 | 0,43 |
| | S420MLO | 0,14 | 0,55 | 1,65 | 0,015 | 0,025 | 0,25 | 0,25 | 0,70 | 0,015-0,055 | 0,30 | 0,012 | 0,050 | 0,025 | 0,080 | 0,80 | 0,09 | 0,11 | 0,43 |
| | S420ML10 ²⁾ | 0,14 | 0,55 | 1,65 | 0,007 | 0,020 | 0,25 | 0,25 | 0,70 | 0,015-0,055 | 0,30 | 0,012 | 0,050 | 0,025 | 0,080 | 0,80 | 0,09 | 0,11 | 0,43 |
| | S460MLO ²⁾ | 0,16 | 0,55 | 1,70 | 0,015 | 0,025 | 0,25 | 0,25 | 0,70 | 0,015-0,055 | 0,30 | 0,012 | 0,050 | 0,025 | 0,080 | 0,80 | 0,12 | 0,13 | 0,43 |
| | S460ML10 ²⁾ | 0,16 | 0,55 | 1,70 | 0,007 | 0,020 | 0,25 | 0,25 | 0,70 | 0,015-0,055 | 0,30 | 0,012 | 0,050 | 0,025 | 0,080 | 0,80 | 0,12 | 0,13 | 0,43 |

¹⁾ The total aluminium to nitrogen ratio shall be a minimum of 2:1. When other nitrogen binding elements are used, the minimum Al value and Al:N ratio does not apply.

²⁾ The levels of the residual elements: arsenic, antimony, tin, lead, bismuth and calcium shall not exceed 0,030% As, 0,010% Sb, 0,020% Sn, 0,010% Pb, 0,010% Bi and 0,005% Ca. Boron (B) shall not exceed 0,0005%. These elements shall be checked at least once every 5000 tonnes at each manufacturing location and shall be reported as a ladle analysis.

³⁾ Upon agreement: Si = 0,14 - 0,25% and P ≤ 0,035% max. for capability of forming a zinc layer during hot-dip galvanisation.

⁴⁾ CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

¹⁾ La relación total aluminio/nitrógeno será, como mínimo, de 2:1. Si se utilizan otros elementos fijadores del nitrógeno, no serán aplicables los requisitos sobre el contenido mínimo de Al y de relación Al:N.

²⁾ La presencia de elementos residuales: arsénico, antimonio, estaño, plomo, bismuto y calcio no superará los siguientes límites: As 0,030%, Sb 0,010%, Sn 0,020%, Pb y Bi 0,010% y Ca 0,005%. El contenido en boro (B) no será superior al 0,0005%. En cada instalación de producción se comprobará el contenido en estos elementos al menos cada 5000 toneladas, notificándose estos resultados como un análisis de colada.

³⁾ Previo acuerdo: Si = 0,14 - 0,25% y P ≤ 0,035% máx. para la capacidad de formar una capa de zinc durante la galvanización por inmersión en baño caliente.

⁴⁾ CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

¹⁾ Całkowity stosunek aluminium do azotu powinien wynosić co najmniej 2:1. Jeśli inne pierwiastki wiążące azot zostały użyte, minimalna zawartość Al i stosunek Al:N nie stosuje się.

²⁾ Poziom szczytkowych pierwiastków: arsen, antymon, cyna, ołów, bizmut i wapń nie powinny przekraczać: As 0,030%, Sb 0,010%, Sn 0,020%, Pb 0,010%, Bi 0,010% i Ca 0,005%. Boron (B) nie powinien przekraczać 0,0005%. Te pierwiastki powinny być sprawdzane co 5000 t w każdej jednostce wytwórczej i powinny być uwzględnione w raporcie z analizy wytopu.

³⁾ Po uzgodnieniu: Si = 0,14 - 0,25% i P ≤ 0,035% max. aby wytworzenie warstwy cynku podczas cynkowania zanurzeniowego na gorąco było możliwe.

⁴⁾ CEV = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

Table 7

HISTAR® and FRITENAR® steel grades for offshore applications

Tabla 7

Calidades de acero HISTAR® y FRITENAR® para aplicaciones offshore

Tabela 7

Gatunki stali HISTAR® i FRITENAR® do zastosowań przybrzeżno-morskich

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Norme Standard Norma | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínimo Minimalna granica plastyczności | | Tensile strength Resistencia a la tracción Wytrzymałość na rozciąganie | Max. ratio Coeficiente máx. maksymalny współczynnik | Minimum elongation Alargamiento mínimo Minimalna ciągliwość | Min. reduction of area mín. reducción del área min. redukcja przekroju | Notch impact test Ensayo de flexión por choque Próba udarnośći z karbem V, en long | | | | |
|----------------------|--------------------------|---|------------|--|---|---|--|--|---|--|---|--|
| | | R _e , MPa | | R _m , MPa | R _e / R _m | $L_0 = 5,65 \cdot \sqrt{S}$ A, % | z ¹⁾ , % | longitudinal longitudinal wzdłużne | | transverse transversal poprzeczna | | |
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | | Temperature Temperatura Temperatura | Absorbed energy Energía absorbida Energia zabsorbowana | Temperature Temperatura Temperatura | Absorbed energy Energía absorbida Energia zabsorbowana |
| | | ≤16 | >16 ≤40 | | | | | | °C | J | °C | J |

| ArcelorMittal Standard | HISTAR® 355 TZ OS | 355 | 355 | 460-620 | 0,87 | 22 | 25 | - | - | -40 | - |
|------------------------|----------------------|--------------------|-----|---------|---------|------|----|-----|----|-----|-----|
| | | HISTAR® 355 TZK OS | 355 | 355 | 460-620 | 0,87 | 22 | 35 | - | - | -40 |
| | HISTAR® 460 TZ OS | 460 | 460 | 530-720 | 0,90 | 17 | 25 | -40 | 60 | - | - |
| | HISTAR® 460 TZK OS | 460 | 460 | 530-720 | 0,90 | 17 | 35 | - | - | -40 | 50 |
| | FRITENAR® 355 OS | 355 | 345 | 460-610 | 0,87 | 22 | - | -20 | 50 | - | - |
| | FRITENAR® 355 TZK OS | 355 | 345 | 460-620 | 0,87 | 22 | 35 | - | - | -40 | 50 |

1) Test upon request.

1) Prueba bajo pedido.

1) Wartość sprawdzana na zamówienie.

Chemical composition / Composición química / Skład chemiczny

| Norme Standard Norma | Grades Calidades Gatunki | Ladle analysis Análisis de colada Analiza wytopu | | | | | | | | | |
|----------------------|--------------------------|--|-----------|-------------------------|----------|----------|-------------------------|-----------|-----------|----------|--------------------------|
| | | C max. % | Mn max. % | Si ³⁾ max. % | P max. % | S max. % | Al ¹⁾ min. % | Nb max. % | Ti max. % | V max. % | CEV ²⁾ max. % |

| | | | | | | | | | | | |
|------------------------|----------------------|------|------|------|-------|-------|------|------|-------|------|------|
| Arceor/Mittal Standard | HISTAR® 355 TZ OS | 0,12 | 1,60 | 0,30 | 0,025 | 0,010 | 0,02 | 0,04 | 0,025 | 0,06 | 0,38 |
| | HISTAR® 355 TZK OS | 0,12 | 1,60 | 0,30 | 0,020 | 0,007 | 0,02 | 0,04 | 0,025 | 0,06 | 0,38 |
| | HISTAR® 460 TZ OS | 0,12 | 1,70 | 0,30 | 0,025 | 0,010 | 0,02 | 0,05 | 0,025 | 0,06 | 0,39 |
| | HISTAR® 460 TZK OS | 0,12 | 1,70 | 0,30 | 0,020 | 0,007 | 0,02 | 0,05 | 0,025 | 0,06 | 0,39 |
| | FRITENAR® 355 OS | 0,12 | 1,60 | 0,30 | 0,030 | 0,025 | 0,02 | 0,04 | 0,025 | 0,06 | 0,38 |
| | FRITENAR® 355 TZK OS | 0,12 | 1,60 | 0,30 | 0,020 | 0,007 | 0,02 | 0,04 | 0,025 | 0,06 | 0,38 |

¹⁾ When other N-binding elements are used, the min. Al value does not apply.

²⁾ $CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15$.

³⁾ Upon agreement: Si = 0,14 - 0,25% and P ≤ 0,035% max. for capability of forming a zinc layer during hot-dip galvanisation.

¹⁾ Cuando se utilizan otros elementos que fijan el nitrógeno, el requisito de contenido mínimo de aluminio no es aplicable.

²⁾ $CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15$.

³⁾ Previo acuerdo: Si = 0,14 - 0,25% y P ≤ 0,035% máx. para la capacidad de formar una capa de zinc durante la galvanización por inmersión en baño caliente.

¹⁾ Gdy inne pierwiastki wiążące azot są obecne, min. wartość aluminium nie ma zastosowania.

²⁾ $CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15$.

³⁾ Po uzgodnieniu: Si = 0,14 - 0,25% i P ≤ 0,035% max. aby wytworzenie warstwy cynku podczas cynkowania zanurzeniowego na gorąco było możliwe.

Table 8 Structural steels with improved atmospheric corrosion resistance according to European standard and Arcorox® trademark steels

Tabla 8 Aceros estructurales con resistencia mejorada a la corrosión atmosférica según norma europea y aceros de marca registrada Arcorox®

Tabela 8 Stal konstrukcyjna o ulepszonej odporności na korozję atmosferyczną zgodnie z normą europejską oraz stal markowa Arcorox®

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínimo min. granica plastyczności w | | | Tensile strength Resistencia a la tracción Wytrzymałość na rozciąganie | | Minimum elongation Alargamiento mínimo Minimalna ciągliwość | |
|----------------------------|--------------------------------|--|------------|------------|--|--|---|------------|
| | | R _{eH} , MPa | | | R _m , MPa | | L _o = 5,65*√S _o A, % | |
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | |
| | | ≤16 | >16 ≤40 | >40 ≤63 | ≥3 ≤63 | | ≥3 ≤40 | >40 ≤63 |

| | | | | | | | | |
|---------------------------------|-----------|-----|-----|-----|---------|--|----|----|
| EN 10025-5: 2019 Arcorox® | S235J0W | 235 | 225 | - | 360-510 | | 26 | 25 |
| | S235J2W | 235 | 225 | - | 360-510 | | 26 | 25 |
| | S355J0W | 355 | 345 | 335 | 470-630 | | 22 | 21 |
| | S355J2W | 355 | 345 | 335 | 470-630 | | 22 | 21 |
| | S355K2W ☞ | 355 | 345 | 335 | 470-630 | | 22 | 21 |
| | S460J0W ☞ | 460 | 440 | 430 | 530-710 | | 17 | 16 |
| | S460J2W ☞ | 460 | 440 | 430 | 530-710 | | 17 | 16 |
| | S460K2W ☞ | 460 | 440 | 430 | 530-710 | | 17 | 16 |

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Ladle analysis Análisis de colada Analiza wytopu | | | | | | | | | | |
|--------------------------------|--------------------------------|--|-----------------|-----------|------------|----------------|---------------------|---|-----------------|-----------|-------------------------------|-----------------|
| | | C max. % | Si max. % | Mn % | P % | S max. % | N max. % | Addition of n.b.e. ¹⁾ Adición de e.f.n. ¹⁾ Dodatek p.w.a. ¹⁾ | Cr max. % | Cu % | Others Others Pozostałe | CEV max % |
| EN 10025-5 2019 Arcorox® | S235J0W | 0,13 | 0,40 | 0,20-0,60 | max. 0,040 | 0,040 | 0,012 | - | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | 0,44 |
| | S235J2W ⁵⁾ | 0,13 | 0,40 | 0,20-0,60 | max. 0,040 | 0,035 | - | yes / si / tak | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | |
| | S355J0W | 0,16 | 0,50 | 0,50-1,50 | max. 0,040 | 0,040 | 0,012 ⁴⁾ | - | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | 0,52 |
| | S355J2W ⁵⁾ | 0,16 | 0,50 | 0,50-1,50 | max. 0,035 | 0,035 | - | yes / si / tak | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | |
| | S355K2W ⁵⁾ | 0,16 | 0,50 | 0,50-1,50 | max. 0,035 | 0,035 | - | yes / si / tak | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | |
| | S460J0W | 0,20 | 0,65 | max. 1,40 | max. 0,040 | 0,040 | 0,025 | yes / si / tak | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | 0,52 |
| | S460J2W ⁵⁾ | 0,20 | 0,65 | max. 1,40 | max. 0,035 | 0,035 | 0,025 | yes / si / tak | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | |
| | S460K2W ⁵⁾ | 0,20 | 0,65 | max. 1,40 | max. 0,035 | 0,035 | 0,025 | yes / si / tak | 0,40-0,80 | 0,25-0,55 | ^{2) 3)} | |

¹⁾ Addition of nitrogen binding elements: the steels shall contain at least one of the following elements: Al total $\geq 0,020\%$, Nb: 0,015 - 0,060%, V: 0,02-0,12%, Ti: 0,02 - 0,10%.
If these elements are used in combination, at least one of them shall be present with the minimum content indicated.

²⁾ The steels may show a Ni content of max. 0,65%.

³⁾ The steels may contain max. 0,30% Mo and max. 0,15% Zr.

⁴⁾ The max. value for nitrogen does not apply if the chemical composition shows a minimum total Al content of 0,020% or if sufficient other N binding elements are present.
The N binding elements shall be mentioned in the inspection document.

⁵⁾ Fully killed steel containing nitrogen binding elements in amounts sufficient to bind available nitrogen (for example 0,02% Al).
If other elements are used they shall be reported in the inspection document.

¹⁾ Adición de elementos fijadores de nitrógeno: los aceros deben contener al menos uno de los elementos siguientes: Al total $\geq 0,020\%$, Nb: 0,015 - 0,060%, V: 0,02-0,12%, Ti: 0,02 - 0,10%.
Si estos elementos están combinados, al menos uno de ellos debe estar presente en la cantidad mínima indicada.

²⁾ Los aceros pueden contener como máximo un 0,65% de Ni.

³⁾ Los aceros pueden contener como máximo un 0,30% de Mo y un 0,15% de Zr.

⁴⁾ El valor máx. exigido para el nitrógeno no se aplica cuando la composición química presenta un contenido mínimo de Al total del 0,020% o cuando existe una cantidad suficiente de otros elementos que fijan el N. El documento de inspección mencionará los elementos que fijan el N.

⁵⁾ Acero totalmente calmado con contenido de elementos fijadores del nitrógeno en cantidad suficiente para combinarse con el nitrógeno disponible (por ejemplo, min. 0.02 %Al).
Cuando se utilice otros elementos, estos deben indicarse en el documento de inspección.

¹⁾ Dodatek pierwiastków wiążących azot: stal powinna zawierać co najmniej jeden z następujących pierwiastków: Al łącznie $\geq 0,020\%$, Nb: 0,015 - 0,060%, V: 0,02-0,12%, Ti: 0,02 - 0,10%.
Jeżeli te pierwiastki zostaną użyte w połączeniu, co najmniej jeden z nich musi być obecny w minimalnej podanej ilości.

²⁾ Stal może wykazywać zawartość Ni w maksymalnej ilości 0,65%.

³⁾ Stal może zawierać max. 0,30% Mo i max. 0,15% Zr.

⁴⁾ Maksymalna wartość azotu nie ma zastosowania, jeżeli skład chemiczny wykazuje minimalną całkowitą zawartość Al 0,020%, lub jeżeli inne pierwiastki wiążące N obecne są w wystarczającej ilości.
Pierwiastki wiążące N muszą być podane w dokumentacji kontrolnej.

⁵⁾ Stal całkowicie uspokojona, zawierająca pierwiastki wiążące azot w ilościach wystarczających do związania dostępnego azotu (na przykład 0,02% Al).
Jeżeli są używane pozostałe pierwiastki, muszą zostać podane w dokumentacji kontrolnej.

Table 9 Structural steel 16Mo3 and P265GH with specified elevated temperature properties

Tabla 9 Acero estructural 16Mo3 y P265GH con propiedades específicas para alta temperatura

Tabela 9 Stal konstrukcyjna 16Mo3 i P265GH o określonych właściwościach dla podwyższonej temperatury

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Minimum yield strength Límite elástico mínimo min. granica plastyczności w R_{eH} , MPa | | Tensile strength Resistencia a la tracción Wytrzymałość na rozciąganie R_m , MPa | | Minimum elongation Alargamiento mínimo Minimalna ciągliwość $L_0 = 5,65 \cdot \sqrt{S_0}$ A, % | | Notch impact test, longitudinal Ensayo de flexión por choque, longitudinal Próba udarności Temperature/Temperatura/Temperatura | | |
|----------------------------|--------------------------------|--|------------|--|------------|--|---|--|--|--|
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | | | | | | °C | | |
| | | ≤16 | >16 ≤40 | ≤16 | >16 ≤40 | -20 | 0 | +20 | | |

| | | | | | | | | | | |
|--|--------|-----|-----|-----------|--|----|--|-----------------|-----------------|----|
| EN 10028-2: 2017 + EN 10273: 2016 | 16Mo3 | 275 | 270 | 440 - 590 | | 24 | | 2 ¹⁾ | 2 ²⁾ | 40 |
| | P265GH | 265 | 255 | 410 - 530 | | 23 | | - | 40 | 47 |

| Standard Norma Norma | Grades Calidades Gatunki | 0,2% proof strength at temperature, min. ²⁾ 0,2% Límite elástico a temperatura, min. ²⁾ 0,2% umowna granica elastyczności dla odkształcenia w temperaturze, min. ²⁾ N/mm ² | | | | | | | | | | |
|----------------------------|--------------------------------|---|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | Nominal thickness (mm) Espesor nominal (mm) Grubość nominalna (mm) | 50 °C | 100 °C | 150 °C | 200 °C | 250 °C | 300 °C | 350 °C | 400 °C | 450 °C | 500 °C |

| | | | | | | | | | | | | |
|--|--------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| EN 10028-2: 2017 + EN 10273: 2016 | 16Mo3 | ≤16 | 273 | 264 | 250 | 233 | 213 | 194 | 175 | 159 | 147 | 141 |
| | | 16 < t ≤ 40 | 268 | 259 | 245 | 228 | 209 | 190 | 172 | 156 | 145 | 139 |
| | P265GH | ≤16 | 256 | 241 | 223 | 205 | 188 | 173 | 160 | 150 | - | - |
| | | 16 < t ≤ 40 | 247 | 232 | 215 | 197 | 181 | 166 | 154 | 145 | - | - |

¹⁾ A value may be agreed at the time of enquiry and order.

²⁾ Tensile tests can be carried out upon request.

¹⁾ Se puede acordar otro valor en el momento de solicitar la oferta y hacer el pedido.

²⁾ Se pueden elaborar ensayos de tracción previo acuerdo.

¹⁾ Wartość może być uzgodniona w zapytaniu ofertowym lub zamówieniu.

²⁾ Na życzenie mogą być przeprowadzone próby rozciągania.

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Cast analysis Análisis del producto Analiza wytopu | | | | | | | | | | | | | | |
|--|--------------------------------|--|------------|-------------|-----------|-----------|------------|---------------------|-----------|------------|------------|-------------|------------|------------|-----------|---------------------|
| | | C | Si max. | Mn | P max. | S max. | Ni max. | Al total min. | N max. | Cr max. | Cu max. | Mo | Nb max. | Ti max. | V max. | max. Cr+Cu+Mo+Ni |
| | | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % |
| EN 10028-2: 2017 + EN 10273: 2016 | 16Mo3 | 0,12 - 0,20 | 0,35 | 0,40 - 0,90 | 0,025 | 0,010 | 0,30 | - | 0,012 | 0,30 | 0,30 | 0,25 - 0,35 | - | - | - | - |
| | P265GH | max 0,20 | 0,40 | 0,50 - 1,40 | 0,025 | 0,015 | 0,30 | 0,020 | 0,012 | 0,30 | 0,30 | max 0,08 | 0,020 | 0,03 | 0,02 | 0,70 |

Table 10 Steel grades according to American standards

Tabla 10 Calidades de acero según normas americanas

Tabela 10 Gatunki stali zgodne z normami amerykańskimi

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Yield strength R_e Límite elástico R_e Granica plastyczności R_e | Tensile strength R_m Resistencia a la tracción R_m Wytrzymałość na rozciąganie R_m | Ratio R_e/R_m Ratio R_e/R_m Proporcja R_e/R_m | Minimum elongation A Alargamiento mínimo A Minimalna ciągliwość A | | Notch impact test ³⁾ Ensayo de flexión por choque ³⁾ Próba udarności z karbem V, en long ³⁾ | |
|----------------------------|--------------------------------|---|---|---|---|-----------------------|--|--|
| | | MPa [ksi] | MPa [ksi] | | min. 200 mm [8 in.] | min. 50 mm [2 in.] | ASTM A673, standard position longitudinal, flange posición estándar, longitudinal, ala posición estándar, longitudinal, ala posición estándar, longitudinal, ala | Temperature Temperatura Temperatura °C (°F) |

| | | | | | | | | |
|-------------|-----------------------|-------------------------|-------------------------------|-------|------------------|----------------------|---------|----------|
| A36-14 | Grade 36 | ≥250 [36] | 400-550 ²⁾ [58-80] | | 20 ¹⁾ | 21 ²⁾ | | |
| A572-18 | Grade 42 | ≥290 [42] | ≥415 [60] | | 20 ¹⁾ | 24 ^{1) 2b)} | | |
| | Grade 50 | ≥345 [50] | ≥450 [65] | | 18 ¹⁾ | 21 ^{1) 2b)} | | |
| | Grade 55 | ≥380 [55] | ≥485 [70] | | 17 ¹⁾ | 20 ^{1) 2b)} | | |
| | Grade 60 | ≥415 [60] | ≥520 [75] | | 16 ¹⁾ | 18 ^{1) 2b)} | | |
| | Grade 65 | ≥450 [65] | ≥550 [80] | | 15 ¹⁾ | 17 ^{1) 2b)} | | |
| A588-19 | Grade B ⁶⁾ | ≥345 [50] | ≥485 [70] | | 18 ¹⁾ | 21 ^{1) 2a)} | | |
| A709-18 | Grade 36 | ≥250 [36] | 400-550 [58-80] | | 20 ¹⁾ | 21 ^{1) 2)} | | 5) |
| | Grade 50 | ≥345 [50] | ≥450 [65] | | 18 ¹⁾ | 21 ^{1) 2)} | | 5) |
| | Grade 50S | 345-450 [50-65] | ≥450 [65] | ≤0,85 | 18 ¹⁾ | 21 ¹⁾ | | 5) |
| A913-19 | Grade 50 | ≥345 ⁴⁾ [50] | ≥450 [65] | | 18 | 21 | 21 [70] | ≥54 [40] |
| | Grade 65 | ≥450 [65] | ≥550 [80] | | 15 | 17 | 21 [70] | ≥54 [40] |
| | Grade 70 | ≥485 [70] | ≥620 [90] | | 14 | 16 | 21 [70] | ≥54 [40] |
| | Grade 80 | ≥550 [80] | ≥655 [95] | | 13 | 15 | 21 [70] | ≥31 [40] |
| A992-11(15) | Grade 50 | 345-450 [50-65] | ≥450 [65] | ≤0,85 | 18 ¹⁾ | 21 ¹⁾ | | |

¹⁾ See elongation requirement adjustments under the "Tension Tests" section of standard A6 / A6M.

²⁾ For shapes with flange thickness >75 mm (3 in): A min. 19% on 2 in. (50 mm), Gr.36 exempted of R_m max.

^{2a)} For shapes with flange thickness >75 mm (3 in): A min. 18% on 2 in. (50 mm)

^{2b)} For shapes over 634 Kg/m (426 lb/ft): A min. 19% on 2 in. (50 mm)

³⁾ Upon agreement: supplementary requirement S30 of ASTM A 6/A 6M: "CVN test, alternate core location" = min. ave energy 27J [20 ft-lbf] at +21 °C [70 °F], applicable to flange thickness ≥ 38.1 mm [1.5 in.].

⁴⁾ Upon agreement: supplementary requirement S75 of ASTM A 913/A913M: R_e/R_m max. 0.85 and R_e max. 450 MPa [65 ksi], applicable to Grade 50

⁵⁾ Supplementary requirement upon agreement: notch impact test according to A709.

⁶⁾ Available for a nominal thickness up to ≤63 mm.

¹⁾ Véanse los ajustes relativos a los requisitos de elongación en el apartado «Ensayos de Tensión» de la norma A6 / A6M.

²⁾ Para perfiles con espesor de ala >75 mm (3 pulg): A min. 19% en 2 pulg. (50 mm), Gr.36 exento de R_m máx.

^{2a)} Para perfiles con espesor de ala >75 mm (3 pulg): A min. 18% en 2 pulg. (50 mm).

^{2b)} Para perfiles superiores a 634 Kg/m (426 lb/ft): A min. 19% en 2 pulg. (50 mm).

³⁾ Previo acuerdo: requisito adicional S30 según ASTM A 6/A 6M: «CVN test, alternate core location» = «Ensayo CVN, intersección núcleo-ala», resiliencia media mín. 27J [20 ft-lbf] a 21 °C. [70 °F], aplicable a espesor del ala ≥ 38.1 mm [1.5 pulg.].

⁴⁾ Previo acuerdo: requisito adicional S75 según ASTM A 913 / A913M: R_e/R_m máx. 0.85 y R_e máx. 450 MPa [65 ksi], aplicable a Calidad 50.

⁵⁾ Requisito adicional previo acuerdo: ensayo de resiliencia conforme a la tabla de A709.

⁶⁾ Disponible hasta un espesor nominal de ≤63 mm.

¹⁾ Patrz dostosowanie wymagań dotyczących wydłużenia zgodnie z sekcją «Próby rozciągania» w normie A6 / A6M.

²⁾ Dla kształtowników o grubości stopki >75 mm (3 cale): Min. 19% przy 2 calach (50 mm), Gatunek 36 wyłączony z R_m max.

^{2a)} Dla kształtowników o grubości stopki >75 mm (3 cale): Min. 18% przy 2 calach (50 mm).

^{2b)} Dla kształtowników powyżej 634 Kg/m (426 funtów/stopę): Min. 19% przy 2 calach (50 mm).

³⁾ Po uzgodnieniu: dodatkowe wymagania dot. S30 wg ASTM A 6/A 6M: «Próba CVN, alternatywna lokalizacja rdzenia» = min. sr. energia 27J [20 ft-lbf] przy 21 °C [70 °F], zastosowanie dla stopki o grubości ≥ 38,1 mm [1,5 cala].

⁴⁾ Po uzgodnieniu: dodatkowe wymagania dot. S75 w ASTM A 913/A913M: R_e/R_m max. 0.85 i R_e max. 450 MPa [65 ksi], ma zastosowanie do gatunku 50.

⁵⁾ Dodatkowe wymagania po uzgodnieniu: próba udarności z karbem zgodnie z A709.

⁶⁾ Dostępne dla nominalnych grubości do ≤63 mm.

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Cast analysis Análisis del producto Analiza wytopu | | | | | | | | | | | | | Other elements Otros elementos Pozostałe pierwiastki |
|----------------------------|--------------------------------|--|-------------------------|---------------------|----------------|----------------------|---------------|---------------|-----------|-----------------|--------------------|----------------------|-------------------------------|------------------|---|
| | | C max. % | Mn % | S max. % | P max. % | Si % | Cu % | Ni % | Cr % | Mo max. % | Nb max. % | V % | CE ¹⁾ max. % | | |
| A36-14 | Grade 36 | 0,26 | ³⁾ | 0,05 | 0,04 | ≤ 0,40 ³⁾ | ⁷⁾ | | | | | | | | |
| A572-18 | Grade 42 | 0,21 | ≤ 1,35 ³⁾ | 0,05 | 0,04 | ≤ 0,40 ³⁾ | ⁷⁾ | | | | ²⁾ | ²⁾ | | ²⁾ | |
| | Grade 50 | 0,23 | ≤ 1,35 ²⁾ | 0,05 | 0,04 | ≤ 0,40 ³⁾ | ⁷⁾ | | | | ²⁾ | ²⁾ | | ²⁾ | |
| | Grade 55 | 0,25 | ≤ 1,35 ²⁾ | 0,05 | 0,04 | ≤ 0,40 ³⁾ | ⁷⁾ | | | | ²⁾ | ²⁾ | | ²⁾ | |
| | Grade 60 | 0,26 | ≤ 1,35 ²⁾ | 0,05 | 0,04 | ≤ 0,40 | ⁷⁾ | | | | ²⁾ | ²⁾ | | ²⁾ | |
| | Grade 65 | 0,23 ⁴⁾ | ≤ 1,65 | 0,05 | 0,04 | ≤ 0,40 | ⁷⁾ | | | | ²⁾ | ²⁾ | | ²⁾ | |
| A588-19 | Grade B | 0,20 ²⁾ | 0,75-1,35 ²⁾ | 0,05 | 0,04 | 0,15-0,50 | 0,20-0,40 | ≤ 0,5 | 0,40-0,70 | | | 0,01-0,10 | | ²⁾ | |
| A709-18 | Grade 36 | 0,26 | ³⁾ | 0,05 | 0,04 | ≤ 0,40 ³⁾ | ⁷⁾ | | | | ²⁾ | ²⁾ | | ²⁾ | |
| | Grade 50 | 0,23 | ≤ 1,35 ²⁾ | 0,05 | 0,04 | ≤ 0,40 ³⁾ | | ²⁾ | | | ²⁾ | ²⁾ | | ²⁾ | |
| | Grade 50S | 0,23 | 0,50-1,60 ²⁾ | 0,045 | 0,035 | ≤ 0,40 | ≤ 0,60 | ≤ 0,45 | ≤ 0,35 | 0,15 | 0,05 ⁵⁾ | ≤ 0,15 ⁵⁾ | 0,45 ⁶⁾ | ^{2) 5)} | |
| A913-19 | Grade 50 | 0,12 | ≤ 1,60 | 0,030 | 0,030 | ≤ 0,40 | ≤ 0,45 | ≤ 0,25 | ≤ 0,25 | 0,07 | 0,05 | ≤ 0,06 | 0,38 | | |
| | Grade 65 | 0,12 | ≤ 1,60 | 0,030 ⁴⁾ | 0,030 | ≤ 0,40 | ≤ 0,35 | ≤ 0,25 | ≤ 0,25 | 0,07 | 0,05 | ≤ 0,08 | 0,43 | | |
| | Grade 70 | 0,12 | ≤ 1,60 | 0,030 ⁴⁾ | 0,030 | ≤ 0,40 | ≤ 0,45 | ≤ 0,25 | ≤ 0,25 | 0,07 | 0,05 | ≤ 0,09 | 0,45 | | |
| | Grade 80 | 0,16 | ≤ 1,80 | ≤ 0,030 | ≤ 0,030 | ≤ 0,50 | ≤ 0,45 | ≤ 0,25 | ≤ 0,25 | ≤ 0,07 | ≤ 0,06 | ≤ 0,10 | 0,49 | | |
| A992-11(15) | Grade 50 | 0,23 | 0,50-1,60 ²⁾ | 0,045 | 0,035 | ≤ 0,40 | ≤ 0,60 | ≤ 0,45 | ≤ 0,35 | 0,15 | 0,05 ⁵⁾ | ≤ 0,15 ⁵⁾ | 0,45 ⁶⁾ | ⁵⁾ | |

¹⁾ CE = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

²⁾ See specific limitations in the standard.

³⁾ For shapes with flange thickness over 75 mm (3 in.): Si min. 0.15% to 0,4%, (Mn 0.85 - 1.35% for A709 and A36)

⁴⁾ Upon agreement: supplementary requirement S77 of ASTM A 913/A913M: Sulphur max. 0.010%, applicable to Grade 65 and Grade 70.

⁵⁾ Nb + V ≤ 0.15%, (N ≤ 0.015% for A992 and grade 50S of A709).

⁶⁾ Max CE = 0.47% for shapes with flange thicknesses over 2 in. (50 mm).

⁷⁾ When copper steel is specified, Cu ≥ 0.20.

¹⁾ CE = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

²⁾ Véanse las restricciones específicas en la norma.

³⁾ Para perfiles con espesor de ala > 75 mm (3 pulg.): Si mín. 0.15% a 0,4%, (Mn 0.85 - 1.35% para A709 y A36).

⁴⁾ Previo acuerdo: requisito adicional S77 según ASTM A 913/A913M: Azufre máx. 0.010%, aplicable a Calidad 65 y Calidad 70.

⁵⁾ Nb + V ≤ 0.15%, (N ≤ 0.015% para A992 y Calidad 50S de según A709).

⁶⁾ Máx CE = 0.47% para perfiles con un espesor de ala superior a 2 pulg. (50 mm).

⁷⁾ Si se acuerda una calidad con cobre, Cu ≥ 0.20.

¹⁾ CE = C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15.

²⁾ Patrz szczególnie ograniczenia w normie.

³⁾ Dla kształtowników o grubości stopki powyżej 75 mm (3 cale): Si min. 0.15% do 0,4%, (Mn 0.85 - 1,35% dla A709 i A36).

⁴⁾ Po uzgodnieniu: dodatkowe wymagania dot. S77 w ASTM A 913/A913M: Siarka max. 0,010%, ma zastosowanie do gatunku 65 i gatunku 70.

⁵⁾ Nb + V ≤ 0,15%, (N ≤ 0,015% dla A992 i gatunku 50S w A709).

⁶⁾ Max CE = 0,47% dla kształtowników o grubości stopki powyżej 2 cale (50 mm).

⁷⁾ Kiedy wyszczególniona jest stal miedziowa, Cu ≥ 0,20.

Table 11
Steel grades according to Russian standards

Tabla 11
Calidades de acero según normas rusas

Tabela 11
Gatunki stali zgodne z normami rosyjskimi

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Minimum yield strength | | | | Tensile strength | | | Minimum elongation | | Notch impact test Ensayo de flexión por choque Próba udarności z korbem V, en long | | | | | | |
|----------------------------|--------------------------------|---------------------------------|------------|-----|------------|-----------------------------|-----|------------|---|-----|--|--------------------------|--|---|--------------------------|--|--|
| | | Límite elástico mín. | | | | Resistencia a la tracción | | | Alargamiento mínimo | | Min. absorbed energy Energía mín. absorbida Min. zaabsorbowana energia | | | | | | |
| | | Minimalna granica plastyczności | | | | Wytrzymałość na rozciąganie | | | Minimalne wydłużenie | | Temperature Température Temperatura | KCU J/cm ² | | Temperature Température Temperatura | KCV J/cm ² | | after mechanical ageing después del envejecimiento mecánico po postarzeniu mechanicznym KCU+20°C; J/cm ² |
| | | R _{eh} , MPa | | | | R _m , MPa | | | L ₀ = 5,65*√S ₀ A, % | | | °C | Nominal thickness (mm) Espesor nominal (mm) Nominalna grubość (mm) | | °C | | |
| ≤10 | >10 ≤16 | >16 ≤20 | >20 ≤40 | ≤10 | >10 ≤20 | >20 ≤40 | ≤20 | >20 ≤40 | | ≤10 | >10 ≤40 | | ≤10 | >10 ≤40 | | | |

| | | | | | | | | | | | | | | | | | |
|------------------------|-------|-----|-----|-----|-----|-----|-----|-----|----|----|-----|-----|----|-----|-----|----|----|
| GOST 27772- 2015 | C255 | 255 | 245 | 245 | 235 | 380 | 370 | 370 | 25 | 24 | -20 | 29 | 29 | 0 | 34 | 34 | 29 |
| | | | | | | | | | | | | -40 | 29 | 29 | -20 | 34 | 34 |
| | C345 | 345 | 325 | 325 | 305 | 480 | 470 | 460 | 21 | 21 | -40 | 39 | 34 | -20 | 34 | 34 | 29 |
| GOST 19281- 2014 | 09G2S | 355 | 355 | 345 | 345 | 480 | 480 | 480 | 21 | 21 | -40 | 34 | 34 | -20 | 34 | 34 | - |
| | | | | | | | | | | | | -40 | 34 | 34 | -20 | 39 | - |

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Cast analysis Análisis del producto Analiza wytopu | | | | | | | | | | | | | Autres éléments Otros elementos Pozostałe pierwiastki |
|----------------------------|--------------------------------|--|---------|----------------|----------------|---------|----------------|----------------|----------------|---------------|----------------|----------------|----------------|-----------------|---|
| | | C max. % | Mn % | S max. % | P max. % | Si % | Cu max % | Ni max % | Cr max % | V max % | Nb max % | Ti max % | Al max % | CE max. % | |

| | | | | | | | | | | | | | | | |
|------------------------|-------|------|---------------|-------|-------|-----------|------|------|------|------|------|-------|------------|------|--|
| GOST 27772- 2015 | C255 | 0,17 | max 1,0 | 0,025 | 0,035 | 0,15-0,30 | 0,30 | 0,30 | 0,30 | - | - | 0,030 | 0,02-0,05 | - | N _{max} 0,008% N _{max} 0,012% when Al _{max} 0,02% |
| | C345 | 0,15 | 1,30- 1,70 | 0,025 | 0,030 | 0,80 max. | 0,30 | 0,30 | 0,30 | 0,08 | 0,06 | 0,035 | 0,015-0,06 | 0,45 | N _{max} 0,008% N _{max} 0,012% when Al _{max} 0,02% |
| | C355 | 0,14 | 1,00- 1,80 | 0,025 | 0,025 | 0,15-0,80 | 0,30 | 0,30 | 0,30 | 0,08 | 0,06 | 0,035 | 0,02-0,06 | 0,45 | N _{max} 0,008% N _{max} 0,012% when Al _{max} 0,02% |
| GOST 19281- 2014 | 09G2S | 0,12 | 1,30- 1,70 | 0,035 | 0,030 | 0,50-0,80 | 0,30 | 0,30 | 0,30 | 0,12 | 0,05 | 0,04 | 0,02-0,05 | 0,46 | ¹⁾ |

¹⁾ Max. Nitrogen should not exceed 0,012%. Non binding Nitrogen content should not exceed 0,008%.
It is allowed to use Al up to 0,05% and Ti up to 0,04% and Nb up to 0,05%.

²⁾ CE = C + Mn/6 + Si/24 + Cr/5 + Ni/40 + Cu/13 + V/14 + P/2

¹⁾ Max. El nitrógeno no debe superar el 0,012%. El contenido de nitrógeno no vinculante no debe superar el 0,008%.
Se permite usar Al hasta 0,05% y Ti hasta 0,04% y Nb hasta 0,05%.

²⁾ CE = C + Mn/6 + Si/24 + Cr/5 + Ni/40 + Cu/13 + V/14 + P/2

¹⁾ Maks. zawartość azotu nie powinna przekraczać 0,012%. Zawartość niewiążącego azotu nie powinna przekraczać 0,008%.
Dopuszcza się stosowanie Al do 0,05%, Ti do 0,04% i Nb do 0,05%.

²⁾ CE = C + Mn/6 + Si/24 + Cr/5 + Ni/40 + Cu/13 + V/14 + P/2

Table 12 Steel grades according to Chinese standards

Tabla 12 Calidades de acero según normas chinas

Tabelle 12 Gatunki stali zgodne z normami chińskimi

Mechanical properties / Propiedades mecánicas / Własności wytrzymałościowe

| Standard Norma Norma | Grades Calidades Gatunki | Yield strength R_e ¹⁾ Límite elástico R_e Granica ¹⁾ plastyczności R_e ¹⁾ | Tensile strength R_m Resistencia a la tracción R_m Wytrzymałość na rozciąganie R_m | Ratio R_e/R_m Ratio R_e/R_m Proporcja R_e/R_m | Minimum elongation A Alargamiento mínimo A Minimalna ciągliwość A | | Notch impact test ²⁾ Ensayo de flexión por choque ²⁾ Próba udarności z karbem V, en long ²⁾ | |
|----------------------------|--------------------------------|---|---|---|---|-----------------------|--|--|
| | | | | | min. 200 mm [8 in.] | min. 50 mm [2 in.] | standard position longitudinal, flange posición estándar, longitudinal, ala pozycja standardowa podłużna, półka | |
| | | MPa | MPa | | % | % | Température Temperatura Temperatura °C | Energy average Media de energía Energia Srednio J |
| GB/T 33968 -2017 | Q345QST | 345 | 450 | 0,85 | 18 | 21 | 20 | 54 |
| | Q420QST | 420 | 520 | 0,85 | 16 | 18 | 20 | 54 |
| | Q460QST ³⁾ | 460 | 550 | 0,85 | 15 | 17 | 20 | 54 |
| | Q485QST | 485 | 620 | 0,85 | 14 | 16 | 20 | 54 |

¹⁾ If the yield phenomenon is not present, the 0.2% proof strength shall be determined.

²⁾ Charpy impact test at other temperatures and energy levels may be agreed at the time of inquiry and order.

³⁾ For S460QST, when thickness is greater than 80mm, the minimum yield strength value is 450MPa.

¹⁾ Si el fenómeno de alargamiento (Luders) no está presente, el valor del 0.2% de la prueba de resistencia deberá ser considerado.

²⁾ La prueba de impacto Charpy en otros niveles de energía y temperatura pueden acordarse en el momento de la consulta pedido.

³⁾ Para S460QST, cuando el espesor es superior a 80 mm, el valor de límite elástico mínimo es de 450MPa.

¹⁾ Jeżeli obserwacja granicy plastyczności jest niemożliwa, wytrzymałość powinna zostać określona dla próby 0.2%.

²⁾ Próba udarności Charpy'ego w innych temperaturach i zakresach energii może zostać ustalona w zapytaniu ofertowego lub zamówieniu.

³⁾ Dla S460QST, gdy grubość jest większa niż 80mm, minimalna wartość granicy plastyczności wynosi 450MPa.

Chemical composition / Composición química / Skład chemiczny

| Standard Norma Norma | Grades Calidades Gatunki | Cast analysis (maximum values) Análisis del producto (valores máximos) Analiza wyt (wartości maksymalne) | | | | | | | | | | | |
|----------------------------|--------------------------------|--|------|-------|-------|------|------|------|------|------|------|------|-------------------|
| | | C | Mn | S | P | Si | Cu | Ni | Cr | Mo | Nb | V | CEV ¹⁾ |
| | | % | % | % | % | % | % | % | % | % | % | % | % |
| GB/T 33968 -2017 | Q345 QST | 0,12 | 1,60 | 0,030 | 0,040 | 0,40 | 0,45 | 0,25 | 0,25 | 0,07 | 0,05 | 0,06 | 0,38 |
| | Q420 QST | 0,14 | 1,60 | 0,030 | 0,030 | 0,40 | 0,35 | 0,25 | 0,25 | 0,07 | 0,04 | 0,06 | 0,40 |
| | Q460 QST | 0,16 | 1,60 | 0,030 | 0,030 | 0,40 | 0,35 | 0,25 | 0,25 | 0,07 | 0,05 | 0,08 | 0,43 |
| | Q485 QST | 0,16 | 1,60 | 0,030 | 0,040 | 0,40 | 0,45 | 0,25 | 0,25 | 0,07 | 0,05 | 0,09 | 0,45 |

¹⁾ $CEV = C + Mn/6 + (Cr + Mo + V)/6 + (Ni + Cu)/15$

¹⁾ $CEV = C + Mn/6 + (Cr + Mo + V)/6 + (Ni + Cu)/15$

¹⁾ $CEV = C + Mn/6 + (Cr + Mo + V)/6 + (Ni + Cu)/15$

Table 13

Comparison tables of typical steel grades

Tabla 13

Tablas comparativas de las calidades típicas de acero

Tabela 13

Tabele porównawcze typowych gatunków stali

| Structural steels / Aceros estructurales / Stal konstrukcyjna | | | | | | | | | | | | | |
|---|---|-------------------|----------------|-----------|--------|------------------------------|----------|----------|-----------|----------------|------------|--------------------|--------------------------|
| EN 10025-2: 2019 | Previous standards / Normas anteriores / Poprzednie normy | | | | | | | | | | ASTM | CSA G 40- 21 | JIS G 3101 JIS G 3106 |
| | EN 10025: 1990 + A1: 1993 | EN 10025: 1990 | NF A 35-501 | DIN 17100 | BS4360 | UNE 36 080 NBN A21-101 | UNI 7070 | SS 14 | NS 12 101 | ÖNORM M1316 | | | |
| S235JR | S235JR | Fe360B | E24-2 | St37-2 | | AE235B | Fe360B | 13 11-00 | NS 12 120 | | | | |
| S235J0 | S235JRG1 | Fe360BFU | | Ust37-2 | | AE235B-FU | | | NS 12 122 | USt 360 B | | | |
| S235J2 | S235JRG2 | Fe360BFN | | RSt37-2 | 40B | AE235B-FN | | 13 12-00 | NS 12 123 | RSt 360 B | | | |
| | S235J0 | Fe360C | E24-3 | St37-3U | 40C | AE235C | Fe360C | | NS 12 124 | St 360 C | | | |
| | S235J2G3 | Fe360D1 | E24-4 | St37-3N | 40D | AE235D | Fe360D | | NS 12 124 | St 360 CE | | | |
| | S235J2G4 | Fe360D2 | | | | | | | | St 360 D | | | |
| S275JR | S275JR | Fe430B | E28-2 | St44-2 | 43B | AE255B | Fe430B | 14 12-00 | NS 12 142 | St 430 B | A 36 | 260 W | SS 400 |
| S275J0 | S275J0 | Fe430C | E28-3 | St44-3U | 43C | AE255C | Fe430C | | NS 12 143 | St 430 C | | | SM 400 |
| S275J2 | S275J2G3 | Fe430D1 | E28-4 | St44-3N | 43D | AE255D | Fe430D | 14 14-00 | NS 12 143 | St 430 CE | | | A/B/C |
| | S275J2G4 | Fe430D2 | | | | | | 14 14-01 | | St 430 D | | 300 W | |
| S355JR | S355JR | Fe510B | E36-2 | | 50B | AE355B | Fe510B | | | | A572 Gr.50 | 350 W | SS 490 |
| S355J0 | S355J0 | Fe510C | E36-3 | St52-3U | 50C | AE355C | Fe510C | 21 32-01 | NS 12 153 | St 510 C | A992 Gr.50 | | |
| S355J2 | S355J2G3 | Fe510D1 | | St52-3N | 50D | AE355D | Fe510D | | NS 12 153 | St 510 D | | | |
| S355K2 | S355K2G3 | Fe510DD1 | E36-4 | | 50DD | AE355-DD | | 21 34-01 | | | | | |
| | S355K2G4 | Fe510DD2 | | | | | | | | | | | |
| S460JR | | | | | | | | | | | A572 Gr.65 | | |
| S460J0 | | | | | | | | | | | A913 Gr.65 | | |
| S460J2 | | | | | | | | | | | | | |
| S460K2 | | | | | | | | | | | | | |
| S500J0 | | | | | | | | | | | A913 Gr.70 | | |
| | | | | | | | | | | | A913 Gr.80 | | |

High strength steels with high notch toughness / Aceros de alta resistencia con elevada tenacidad a la entalla / Stal wysokowytrzymałościowa z wysoką udarnością

| EN 10025-4 (2019) | Previous standards / Normas anteriores / Poprzednie normy | | | | | | ASTM | CSA G 40-21 | JIS G 3101 |
|----------------------|---|----------------------------|-----------------------|---------------|----------------------------|----------------------|-------------|----------------|------------------------|
| | EN 10113-3: 1993 | NF A 35-504 NF A 36-201 | DIN 17102 | BS 4360 | UNI 7382 | SS 14 | | | |
| S355M S355ML | S355M S355ML | E355 | St E 355 TSt E 355 | 50 D 50 EE | Fe E 355 KG Fe E 355 KT | 21 34-01 21 35-01 | A 913 Gr.50 | | |
| | | E375 | | | | | | 400 W | SM 490 YA SM 490 YB |
| S460M S460ML | S460M S 460ML | E460R E460FP | St E 460 TSt E 460 | 55 C 55 EE | Fe E 460 KG Fe E 460 KT | | A 913 Gr.65 | | SM 570 |
| S500M S500ML | | | | | | | A 913 Gr.70 | | |
| | | | | | | | A 913 Gr.80 | | |

Comparison table for HISTAR® grades / Tabla comparativa de calidades HISTAR® / Tabela porównawcza dla gatunków stali HISTAR®

| HISTAR® | Previous standards / Normas anteriores / Poprzednie normy | | | | | | ASTM | | | | |
|---------|---|----------------------|----------------------------|-------------|---------|-----------|-----------|-------|-------|-------|---------------|
| | EN 10025-2 (2019) | EN 10025-4 (2019) | NF A 35-504 NF A 36-201 | NF A 35-501 | BS 4360 | DIN 17100 | DIN 17102 | A 572 | A 913 | A 992 | JIS G 3106 |
| 355 | S355 | S355 | E355 | E36 | 50 D | St 52-3 | St E 355 | Gr.50 | Gr.50 | Gr.50 | SM 490 B/C/YB |
| 460 | S460 | S460 | E460 | | 55 C | | St E 460 | Gr.65 | Gr.65 | | SM 570 |
| | | | | | | | | | Gr.70 | | |
| | | | | | | | | | Gr.80 | | |

Comparison table of steel grades for offshore applications / Tabla comparativa de acero para aplicaciones en alta mar / Tabela porównawcza dla gatunków stali do zastosowań przybrzeżno-morskich

| EN10225: 2019 | Previous Standard / Normas anteriores / Poprzednie normy EN 10225:2009 | HISTAR® offshore |
|---------------|---|--------------------|
| S355MO | S355G4+M | |
| S355MLO | S355G11+M | HISTAR® 355 TZ OS |
| S355ML10 | S355G12+M | HISTAR® 355 TZK OS |
| S420MLO | S420G3+M | |
| S420ML10 | S420G4+M | |
| S460MLO | S460G3+M | HISTAR® 460 TZ OS |
| S460ML10 | S460G4+M | HISTAR® 460 TZK OS |



ArcelorMittal Differdange, Luxembourg
Rolling process

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Universal beams UB

| Designation | Mass per metre [kg/m] | | | | | | | | | | | | | | | |
|---------------|-----------------------|-------|-------|------|-------|------|------|------|------|------|------|------|-------|-------|-------|-------|
| | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| UB 1100 x 400 | 343* | 390* | 433* | 499* | 548* | 607* | | | | | | | | | | |
| UB 1000 x 400 | 296* | 321* | 371* | 412* | 443* | 483* | 539* | 554* | 591* | 642* | 748* | 883* | 976* | | | |
| UB 1016 x 305 | 222 | 249 | 272 | 314 | 350 | 393 | 415 | 438 | 494 | 584 | | | | | | |
| UB 920 x 420 | 344* | 368* | 390* | 420* | 449* | 491* | 537* | 588* | 656* | 725* | 787* | 970* | 1077* | 1194* | 1269* | 1377* |
| UB 914 x 305 | 201 | 224 | 238 | 253 | 271 | 289 | 313 | 345 | 381 | 425 | 474 | 521 | 576 | | | |
| UB 840 x 400 | 299* | 329* | 359* | 392* | 433* | 473* | 527* | 576* | | | | | | | | |
| UB 838 x 292 | 176 | 194 | 226 | 251* | | | | | | | | | | | | |
| UB 760 x 380 | 257* | 284* | 314* | 350* | 389* | 434* | 484* | 531* | 582* | | | | | | | |
| UB 762 x 267 | 134 | 147 | 173 | 197 | 220* | | | | | | | | | | | |
| UB 690 x 360 | 217* | 240* | 265* | 289* | 323* | 350* | 384* | 419* | 457* | 500* | 548* | 802* | | | | |
| UB 686 x 254 | 125 | 140 | 152 | 170 | 192* | | | | | | | | | | | |
| UB 610 x 325 | 155* | 174* | 195* | 217* | 241* | 262* | 285* | 307* | 341* | 372* | 415* | 455* | 498* | 551* | | |
| UB 610 x 305 | 149 | 179 | 238 | | | | | | | | | | | | | |
| UB 610 x 229 | 101 | 113 | 125 | 140 | 153* | | | | | | | | | | | |
| UB 610 x 178 | 82,0* | 92,0* | | | | | | | | | | | | | | |
| UB 533 x 210 | 82,2 | 92,1 | 101 | 109 | 122 | 138* | | | | | | | | | | |
| UB 533 x 165 | 66,0* | 74,0* | 85,0* | | | | | | | | | | | | | |
| UB 457 x 191 | 67,1 | 74,3 | 82,0 | 89,3 | 98,3 | 106* | | | | | | | | | | |
| UB 457 x 152 | 52,3 | 59,8 | 67,2 | 74,2 | 82,1 | | | | | | | | | | | |
| UB 406 x 178 | 54,1 | 60,1 | 67,1 | 74,2 | 85,0* | | | | | | | | | | | |
| UB 406 x 140 | 39,0 | 46,0 | 53,3* | | | | | | | | | | | | | |
| UB 356 x 171 | 45,0 | 51,0 | 57,0 | 67,1 | | | | | | | | | | | | |
| UB 356 x 127 | 33,1 | 39,1 | | | | | | | | | | | | | | |
| UB 305 x 165 | 40,3 | 46,1 | 54,0 | | | | | | | | | | | | | |
| UB 305 x 127 | 37,0 | 41,9 | 48,1 | | | | | | | | | | | | | |
| UB 305 x 102 | 24,8 | 28,2 | 32,8 | | | | | | | | | | | | | |
| UB 254 x 146 | 31,1 | 37,0 | 43,0 | | | | | | | | | | | | | |
| UB 254 x 102 | 22,0 | 25,2 | 28,3 | | | | | | | | | | | | | |
| UB 203 x 133 | 25,1 | 30,0 | | | | | | | | | | | | | | |
| UB 203 x 102 | 23,1 | | | | | | | | | | | | | | | |
| UB 178 x 102 | 19,0 | | | | | | | | | | | | | | | |
| UB 152 x 89 | 16,0 | | | | | | | | | | | | | | | |
| UB 127 x 76 | 13,0 | | | | | | | | | | | | | | | |

Universal columns UC

| Designation | Mass per metre [kg/m] | | | | | | | | | | | | | | | | |
|--------------|-----------------------|------|------|------|------|------|-----|------|------|-----|-----|-----|-----|-----|------|------|------|
| | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | |
| UC 356 x 406 | 235 | 287 | 340 | 393 | 467 | 509 | 551 | 592 | 634 | 677 | 744 | 818 | 900 | 990 | 1086 | 1202 | 1299 |
| UC 356 x 368 | 129 | 153 | 177 | 202 | | | | | | | | | | | | | |
| UC 305 x 305 | 96,9 | 118 | 137 | 158 | 198 | 240 | 283 | 313* | 342* | | | | | | | | |
| UC 254 x 254 | 73,1 | 88,9 | 107 | 132 | 167 | | | | | | | | | | | | |
| UC 203 x 203 | 46,1 | 52,0 | 60,0 | 71,0 | 86,1 | 100* | | | | | | | | | | | |
| UC 152 x 152 | 23,0 | 30,0 | 37,0 | 44,0 | 51,0 | | | | | | | | | | | | |

Wide flange bearing piles HP

| Designation | Mass per metre [kg/m] | | | | | | | | |
|-------------|-----------------------|------|------|-----|-----|-----|-----|-----|-----|
| | x | x | x | x | x | x | x | x | x |
| HP 400 | 122 | 140 | 158 | 176 | 194 | 213 | 231 | | |
| HP 360 | 109 | 133 | 152 | 174 | 180 | | | | |
| HP 320 | 88,5 | 103 | 117 | 147 | 184 | | | | |
| HP 305 | 78,9 | 88,5 | 94,9 | 110 | 126 | 149 | 180 | 186 | 223 |
| HP 260 | 75,0 | 87,3 | | | | | | | |
| HP 220 | 57,2 | | | | | | | | |
| HP 200 | 42,5 | 53,5 | | | | | | | |

Wide flange bearing piles UBP

| Designation | Mass per metre [kg/m] | | | | | | | |
|---------------|-----------------------|------|------|-----|-----|-----|-----|-----|
| | x | x | x | x | x | x | x | x |
| UBP 356 x 368 | 109 | 133 | 152 | 174 | | | | |
| UBP 305 x 305 | 78,9 | 88,0 | 94,9 | 110 | 126 | 149 | 186 | 223 |
| UBP 254 x 254 | 63,0 | 71,0 | 85,1 | | | | | |
| UBP 203 x 203 | 44,9 | 53,9 | | | | | | |

*These sections are in addition to the range of EN 10 365 sections.

Sections in **bold** are available in ASTM A913 and HISTAR® according to ETA-10/0 156. Detailed product information and other section ranges are shown in this catalogue.

Taper flange I sections J

| Designation | Mass per metre [kg/m] |
|------------------|-----------------------|
| J 152 x 127 x 37 | 37,3 |
| J 127 x 114 x 29 | 29,3 |
| J 127 x 114 x 27 | 26,9 |
| J 127 x 76 x 16 | 16,5 |
| J 114 x 114 x 27 | 26,9 |
| J 102 x 102 x 23 | 23,0 |
| J 102 x 44 x 7 | 7,5 |
| J 89 x 89 x 19 | 19,5 |
| J 76 x 76 x 15 | 15,0 |
| J 76 x 76 x 13 | 12,8 |

Parallel flange channels UPE

| Designation | Mass per metre [kg/m] |
|-------------|-----------------------|
| UPE 400 | 72,2 |
| UPE 360 | 61,2 |
| UPE 330 | 53,2 |
| UPE 300 | 44,4 |
| UPE 270 | 35,2 |
| UPE 240 | 30,2 |
| UPE 220 | 26,6 |
| UPE 200 | 22,8 |
| UPE 180 | 19,7 |
| UPE 160 | 17,0 |
| UPE 140 | 14,5 |
| UPE 120 | 12,1 |
| UPE 100 | 9,8 |
| UPE 80 | 7,9 |

Parallel flange channels PFC

| Designation | Mass per metre [kg/m] |
|--------------------|-----------------------|
| PFC 430 x 100 x 64 | 64,4 |
| PFC 380 x 100 x 54 | 54,0 |
| PFC 300 x 100 x 46 | 45,5 |
| PFC 300 x 90 x 41 | 41,4 |
| PFC 260 x 90 x 35 | 34,8 |
| PFC 230 x 90 x 32 | 32,2 |
| PFC 200 x 90 x 30 | 29,7 |
| PFC 260 x 75 x 28 | 27,6 |
| PFC 180 x 90 x 26 | 26,1 |
| PFC 230 x 75 x 26 | 25,7 |
| PFC 150 x 90 x 24 | 23,9 |
| PFC 200 x 75 x 23 | 23,4 |
| PFC 180 x 75 x 20 | 20,3 |
| PFC 150 x 75 x 18 | 17,9 |
| PFC 125 x 65 x 15 | 14,8 |
| PFC 100 x 50 x 10 | 10,2 |

Taper flange I sections IPN

| Designation | Mass per metre [kg/m] |
|-------------|-----------------------|
| IPN 600 | 199 |
| IPN 550 | 166 |
| IPN 500 | 141 |
| IPN 450 | 115 |
| IPN 400 | 92,4 |
| IPN 380 | 84,0 |
| IPN 360 | 76,1 |
| IPN 340 | 68,0 |
| IPN 320 | 61,0 |
| IPN 300 | 54,2 |
| IPN 280 | 47,9 |
| IPN 260 | 41,9 |
| IPN 240 | 36,2 |
| IPN 220 | 31,1 |
| IPN 200 | 26,2 |
| IPN 180 | 21,9 |
| IPN 160 | 17,9 |
| IPN 140 | 14,3 |
| IPN 120 | 11,1 |
| IPN 100 | 8,3 |
| IPN 80 | 5,9 |

Taper flange channels UPN

| Designation | Mass per metre [kg/m] |
|-------------|-----------------------|
| UPN 400 | 71,8 |
| UPN 380 | 63,1 |
| UPN 350 | 60,6 |
| UPN 320 | 59,5 |
| UPN 300 | 46,2 |
| UPN 280 | 41,8 |
| UPN 260 | 37,9 |
| UPN 240 | 33,2 |
| UPN 220 | 29,4 |
| UPN 200 | 25,3 |
| UPN 180 | 22,0 |
| UPN 160 | 18,8 |
| UPN 140 | 16,0 |
| UPN 120 | 13,4 |
| UPN 100 | 10,6 |
| UPN 80 | 8,6 |
| UPN 65 | 7,1 |
| UPN 50 | 5,6 |

Summary of American Sections

Resumen de las secciones americanas

Podsumowanie kształtowników amerykańskich

Wide flange sections W (metric)

| Designation | Mass per meter (kg/m) | | | | | | | | | | | | | | | |
|----------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| W 1100 x 400 x | 607** | 548* | 499* | 433* | 390* | 343* | | | | | | | | | | |
| W 1000 x 400 x | 976** | 883** | 748** | 642** | 591** | 554* | 483* | 443* | 412* | 371* | 321* | 296* | | | | |
| W 1000 x 300 x | 584** | 494** | 486* | 438* | 393* | 350* | 314* | 272* | 249* | 222 | | | | | | |
| W 920 x 420 x | 1377* | 1269* | 1194* | 1077* | 970* | 787* | 725* | 656* | 588* | 537* | 491* | 449* | 420* | 390* | 368* | 344* |
| W 920 x 310 x | 576* | 521* | 474* | 425* | 381* | 345* | 289* | 271* | 253* | 238* | 223* | 201 | | | | |
| W 840 x 400 x | 576* | 527* | 474* | 433* | 392* | 359* | 329* | 299* | | | | | | | | |
| W 840 x 295 x | 251* | 226* | 210* | 193* | 176 | | | | | | | | | | | |
| W 760 x 380 x | 582* | 531* | 484* | 434* | 389* | 350* | 314* | 284* | 257* | | | | | | | |
| W 760 x 265 x | 220* | 196* | 185* | 173* | 161* | 147 | 134 | | | | | | | | | |
| W 690 x 360 x | 802** | 548** | 500** | 457* | 419* | 350* | 323* | 289* | 265* | 240* | 217* | | | | | |
| W 690 x 250 x | 192* | 170* | 152* | 140 | 125 | | | | | | | | | | | |
| W 610 x 325 x | 551** | 498** | 455** | 415* | 372* | 341* | 307* | 262* | 241* | 217* | 195* | 174* | 155* | | | |
| W 610 x 230 x | 153* | 140* | 125* | 113 | 101 | | | | | | | | | | | |
| W 610 x 180 x | 92 | 82 | | | | | | | | | | | | | | |
| W 530 x 210 x | 138 | 123 | 109 | 101 | 92 | 82 | 72 | | | | | | | | | |
| W 530 x 165 x | 85 | 74 | 66 | | | | | | | | | | | | | |
| W 460 x 280 x | 260 | 235 | 193 | 177 | 158 | 144 | 128 | 113 | | | | | | | | |
| W 460 x 190 x | 106 | 97 | 89 | 82 | 74 | 67 | | | | | | | | | | |
| W 460 x 150 x | 68 | 60 | 52 | | | | | | | | | | | | | |
| W 410 x 260 x | 149 | 132 | 114 | 100 | | | | | | | | | | | | |
| W 410 x 180 x | 85 | 74 | 67 | 60 | 53 | | | | | | | | | | | |
| W 410 x 140 x | 53 | 46,1 | 38,8 | | | | | | | | | | | | | |
| W 360 x 410 x | 1299* | 1202* | 1086* | 990* | 900* | 818** | 744** | 677** | 634** | 592** | 551** | 509** | 463** | 421** | 382** | 347** |
| W 360 x 410 x | | | | | | | | | | | | 314** | 287** | 262** | 237* | 216* |
| W 360 x 370 x | 196* | 179* | 162* | 147* | 134* | | | | | | | | | | | |
| W 360 x 250 x | 122 | 110 | 101 | 91 | | | | | | | | | | | | |
| W 360 x 200 x | 79 | 72 | 64 | | | | | | | | | | | | | |
| W 360 x 170 x | 58 | 51 | 44,6 | | | | | | | | | | | | | |
| W 360 x 130 x | 38,8 | 32,9 | | | | | | | | | | | | | | |
| W 310 x 310 x | 342** | 313** | 283* | 253* | 226* | 202* | 179* | 158* | 143* | 129* | 117* | 107* | 97* | | | |
| W 310 x 250 x | 86 | 79 | | | | | | | | | | | | | | |
| W 310 x 200 x | 74 | 67 | 60 | | | | | | | | | | | | | |
| W 310 x 165 x | 52,0 | 44,6 | 38,8 | | | | | | | | | | | | | |
| W 310 x 100 x | 32,9 | 28,3 | 23,8 | 21 | | | | | | | | | | | | |
| W 250 x 250 x | 149 | 131 | 114 | 101 | 89 | 80 | 73 | | | | | | | | | |
| W 250 x 200 x | 67 | 58 | 49,1 | | | | | | | | | | | | | |
| W 250 x 145 x | 44,6 | 38,8 | 32,9 | | | | | | | | | | | | | |
| W 250 x 100 x | 28,3 | 25,3 | 22,3 | 17,9 | | | | | | | | | | | | |
| W 200 x 200 x | 100 | 86 | 72 | 60 | 52 | 46,1 | | | | | | | | | | |
| W 200 x 165 x | 41,7 | 35,9 | | | | | | | | | | | | | | |
| W 200 x 135 x | 31,3 | 26,6 | | | | | | | | | | | | | | |
| W 200 x 100 x | 22,3 | 19,3 | 15 | | | | | | | | | | | | | |
| W 150 x 150 x | 37,1 | 29,8 | 22,3 | | | | | | | | | | | | | |
| W 150 x 100 x | 23,8 | 17,9 | 13,5 | | | | | | | | | | | | | |
| W 130 x 130 x | 28,3 | 23,8 | | | | | | | | | | | | | | |
| W 100 x 100 x | 19,3 | | | | | | | | | | | | | | | |

Sections with * are available in ASTM A913, Grades 50, 65 and 70.

Sections with ** are available in ASTM A913, Grades 50, 65, 70 and 80.

Wide flange sections W (imperial)

| Designation | Footweights (lb/ft) | | | | | | | | | | | | | | | |
|-----------------|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| W 44 x 16 x | 408** | 368* | 335* | 290* | 262* | 230* | | | | | | | | | | |
| W 40 x 16 x | 655** | 593** | 503** | 431** | 397** | 372* | 362* | 324* | 297* | 277* | 249* | 215* | 199* | | | |
| W 40 x 12 x | 392** | 331** | 327* | 294* | 278* | 264* | 235* | 211* | 183* | 167* | 149 | | | | | |
| W 36 x 16 1/2 x | 925* | 853* | 802* | 723* | 652* | 529* | 487* | 441* | 395* | 361* | 330* | 302* | 282* | 262* | 247* | 231* |
| W 36 x 12 x | 387* | 350* | 318* | 286* | 256* | 232* | 210* | 194* | 182* | 170* | 160* | 150* | 135 | | | |
| W 33 x 15 3/4 x | 387* | 354* | 318* | 291* | 263* | 241* | 221* | 201* | | | | | | | | |
| W 33 x 11 1/2 x | 169* | 152* | 141* | 130* | 118 | | | | | | | | | | | |
| W 30 x 15 x | 391* | 357* | 326* | 292* | 261* | 235* | 211* | 191* | 173* | | | | | | | |
| W 30 x 10 1/2 x | 148* | 132* | 124* | 116* | 108* | 99 | 90 | | | | | | | | | |
| W 27 x 14 x | 539** | 368** | 336** | 307* | 281* | 258* | 235* | 217* | 194* | 178* | 161* | 146* | | | | |
| W 27 x 10 x | 129* | 114* | 102* | 94 | 84 | | | | | | | | | | | |
| W 24 x 12 3/4 x | 370** | 335** | 306** | 279* | 250* | 229* | 207* | 192* | 176* | 162* | 146* | 131* | 117* | 104* | | |
| W 24 x 9 x | 103* | 94* | 84* | 76 | 68 | | | | | | | | | | | |
| W 24 x 7 x | 62 | 55 | | | | | | | | | | | | | | |
| W 21 x 8 1/4 x | 93 | 83 | 73 | 68 | 62 | 55 | 48 | | | | | | | | | |
| W 21 x 6 1/2 x | 57 | 50 | 44 | | | | | | | | | | | | | |
| W 18 x 11 x | 175 | 158 | 143 | 130 | 119 | 106 | 97 | 86 | 76 | | | | | | | |
| W 18 x 7 1/2 x | 71 | 65 | 60 | 55 | 50 | 45 | | | | | | | | | | |
| W 18 x 6 x | 46 | 40 | 35 | | | | | | | | | | | | | |
| W 16 x 10 1/4 x | 100 | 89 | 77 | 67 | | | | | | | | | | | | |
| W 16 x 7 x | 57 | 50 | 45 | 40 | 36 | | | | | | | | | | | |
| W 16 x 5 1/2 x | 36 | 31 | 26 | | | | | | | | | | | | | |
| W 14 x 16 x | 873* | 808* | 730* | 665* | 605* | 550** | 500** | 455** | 426** | 398** | 370** | 342** | 311** | 283** | 257** | 233** |
| W 14 x 16 x | | | | | | | | | | | | 211** | 193** | 176** | 159* | 145* |
| W 14 x 14 1/2 x | 132* | 120* | 109* | 99* | 90* | | | | | | | | | | | |
| W 14 x 10 x | 82 | 74 | 68 | 61 | | | | | | | | | | | | |
| W 14 x 8 x | 53 | 48 | 43 | | | | | | | | | | | | | |
| W 14 x 6 3/4 x | 38 | 34 | 30 | | | | | | | | | | | | | |
| W 14 x 5 x | 26 | 22 | | | | | | | | | | | | | | |
| W 12 x 12 x | 230** | 210** | 190* | 170* | 152* | 136* | 120* | 106* | 96* | 87* | 79* | 72* | 65* | | | |
| W 12 x 10 x | 58 | 53 | | | | | | | | | | | | | | |
| W 12 x 8 x | 50 | 45 | 40 | | | | | | | | | | | | | |
| W 12 x 6 1/2 x | 35 | 30 | 26 | | | | | | | | | | | | | |
| W 12 x 4 x | 22 | 19 | 16 | 14 | | | | | | | | | | | | |
| W 10 x 10 x | 100 | 88 | 77 | 68 | 60 | 54 | 49 | | | | | | | | | |
| W 10 x 8 x | 45 | 39 | 33 | | | | | | | | | | | | | |
| W 10 x 5 3/4 x | 30 | 26 | 22 | | | | | | | | | | | | | |
| W 10 x 4 x | 19 | 17 | 15 | 12 | | | | | | | | | | | | |
| W 8 x 8 x | 67 | 58 | 48 | 40 | 35 | 31 | | | | | | | | | | |
| W 8 x 6 1/2 x | 28 | 24 | | | | | | | | | | | | | | |
| W 8 x 5 1/4 x | 21 | 18 | | | | | | | | | | | | | | |
| W 8 x 4 x | 15 | 13 | 10 | | | | | | | | | | | | | |
| W 6 x 6 x | 25 | 20 | 15 | | | | | | | | | | | | | |
| W 6 x 4 x | 16 | 12 | 9 | | | | | | | | | | | | | |
| W 5 x 5 x | 19 | 16 | | | | | | | | | | | | | | |
| W 4 x 4 x | 13 | | | | | | | | | | | | | | | |

Sections with * are available in ASTM A913, Grades 50, 65 and 70.

Sections with ** are available in ASTM A913, Grades 50, 65, 70 and 80.

Standard sections S (metric)

| Designation | Mass per metre [kg/m] | | | | |
|-------------|-----------------------|------|-----|------|-----|
| S 610 | 180 | 158 | 149 | 134 | 119 |
| S 510 | 143 | 128 | 112 | 98 | |
| S 460 | 104 | 81,4 | | | |
| S 380 | 74 | 64 | | | |
| S 310 | 74 | 60,7 | 52 | 47,3 | |
| S 250 | 52 | 37,8 | | | |
| S 200 | 34 | 27,4 | | | |
| S 150 | 25,7 | 18,6 | | | |
| S 130 | 15 | | | | |
| S 100 | 14,1 | 11,5 | | | |
| S 75 | 11,2 | 8,5 | | | |

Standard sections S (imperial)

| Designation | Footweights (lb/ft) | | | | |
|-------------|---------------------|------|-----|------|----|
| S 24 | 121 | 106 | 100 | 90 | 80 |
| S 20 | 96 | 86 | 75 | 66 | |
| S 18 | 70 | 54,7 | | | |
| S 15 | 50 | 42,9 | | | |
| S 12 | 50 | 40,8 | 35 | 31,8 | |
| S 10 | 35 | 25,4 | | | |
| S 8 | 23 | 18,4 | | | |
| S 6 | 17,25 | 12,5 | | | |
| S 5 | 10 | | | | |
| S 4 | 9,5 | 7,7 | | | |
| S 3 | 7,5 | 5,7 | | | |

Wide flange bearing piles HP (metric)

| Designation | Mass per metre [kg/m] | | | | |
|-------------|-----------------------|-----|-----|-----|----|
| HP 360 x | 174 | 152 | 132 | 108 | |
| HP 310 x | 132 | 125 | 110 | 93 | 79 |
| HP 250 x | 85 | 62 | | | |
| HP 200 x | 53 | 43 | | | |

Wide flange bearing piles HP (imperial)

| Designation | Footweights (lb/ft) | | | | |
|-------------|---------------------|-----|----|----|----|
| HP 14 x | 117 | 102 | 89 | 73 | |
| HP 12 x | 89 | 84 | 74 | 63 | 53 |
| HP 10 x | 57 | 42 | | | |
| HP 8 x | 36 | 29 | | | |

Standard channels C (metric)

| Designation | Mass per metre [kg/m] | | |
|-------------|-----------------------|------|------|
| C 380 x | 50,4 | 60 | 74 |
| C 310 x | 45 | 37 | 30,8 |
| C 250 x | 37 | 30 | 22,8 |
| C 200 x | 20,5 | 17,1 | |

Standard channels C (imperial)

| Designation | Footweights (lb/ft) | | |
|-------------|---------------------|------|------|
| C 15 x | 33,9 | 40 | 50 |
| C 12 x | 30 | 25 | 20,7 |
| C 10 x | 25 | 20 | 15,3 |
| C 8 x | 13,75 | 11,5 | |

Channels MC (metric)

| Designation | Mass per metre [kg/m] | | | | |
|-------------|-----------------------|------|------|------|----|
| MC 460 x | 86 | 77,2 | 68,2 | 63,5 | |
| MC 310 x | 74 | 67 | 60 | 52 | 46 |
| MC 250 x | 61,2 | 50 | 42,4 | 37 | 33 |
| MC 230 x | 37,8 | 35,6 | | | |
| MC 200 x | 33,9 | 31,8 | 29,8 | 27,8 | |
| MC 180 x | 33,8 | 28,4 | | | |
| MC 150 x | 26,8 | 24,3 | 22,8 | | |

Channels MC (imperial)

| Designation | Footweights (lb/ft) | | | | |
|-------------|---------------------|------|------|------|----|
| MC 18 x | 58 | 51,9 | 45,8 | 42,7 | |
| MC 12 x | 50 | 45 | 40 | 35 | 31 |
| MC 10 x | 41,1 | 33,6 | 28,5 | 25 | 22 |
| MC 9 x | 25,4 | 23,9 | | | |
| MC 8 x | 22,8 | 21,4 | 20 | 18,7 | |
| MC 7 x | 22,7 | 19,1 | | | |
| MC 6 x | 18 | 16,3 | 15,3 | | |

Equal leg angles L (metric)

| Designation | Thickness (mm) | | | | | | | |
|---------------|----------------|------|------|------|------|------|------|-----|
| L 305 x 305 x | 34,9 | 31,8 | 28,6 | 25,4 | | | | |
| L 254 x 254 x | 34,9 | 31,8 | 28,6 | 25,4 | 22,2 | 19,1 | | |
| L 203 x 203 x | 28,6 | 25,4 | 22,2 | 19,0 | 15,9 | 14,3 | 12,7 | |
| L 152 x 152 x | 25,4 | 22,2 | 19,0 | 15,9 | 14,3 | 12,7 | 11,1 | 9,5 |
| L 127 x 127 x | 15,9 | 12,7 | 11,1 | 9,5 | 7,9 | | | |
| L 102 x 102 x | 11,1 | 9,5 | 7,9 | | | | | |
| L 89 x 89 x | 9,5 | 7,9 | 6,4 | | | | | |
| L 76 x 51 x | 9,5 | 7,9 | 6,4 | | | | | |
| L 51 x 51 x | 6,4 | 4,8 | | | | | | |

Equal leg angles L (imperial)

| Designation | Thickness (inch) | | | | | | | |
|-------------|------------------|-------|-------|-----|------|------|------|------|
| L 12 x 12 x | 1 3/8 | 1 1/4 | 1 1/8 | 1 | | | | |
| L 10 x 10 x | 1 3/8 | 1 1/4 | 1 1/8 | 1 | 7/8 | 3/4 | | |
| L 8 x 8 x | 1 1/8 | 1 | 7/8 | 3/4 | 5/8 | 9/16 | 1/2 | |
| L 6 x 6 x | 1 | 7/8 | 3/4 | 5/8 | 9/16 | 1/2 | 7/16 | 3/8 |
| L 5 x 5 x | 5/8 | 1/2 | 7/16 | 3/8 | 5/16 | | | 5/16 |
| L 4 x 4 x | 7/16 | 3/8 | 5/16 | | | | | |
| L 3 x 3,5 x | 3/8 | 5/16 | 1/4 | | | | | |
| L 3 x 3 x | 3/8 | 5/16 | 1/4 | | | | | |
| L 2 x 2 x | 1/4 | 3/16 | | | | | | |

Unequal leg angles L (metric)

| Section | Thickness (mm) | | | |
|---------------|----------------|------|------|------|
| L 203 x 102 x | 15,9 | 14,3 | 12,7 | 11,1 |

Unequal leg angles L (imperial)

| Designation | Thickness (inch) | | | |
|-------------|------------------|------|-----|------|
| L 8 x 4 x | 5/8 | 9/16 | 1/2 | 7/16 |

Web tailor-made plates (metric)

| Designation | Mass per metre [kg/m] | | | | |
|-------------|-----------------------|-----|-----|-----|-----|
| WTM 1016 x | 810 | 709 | 608 | 557 | 506 |
| WTM 915 x | 729 | 638 | 547 | 501 | 456 |
| WTM 810 x | 648 | 567 | 486 | 446 | 405 |
| WTM 710 x | 567 | 496 | 425 | 390 | 355 |
| WTM 610 x | 486 | 425 | 365 | 334 | 304 |

Web tailor-made plates (imperial)

| Designation | Footweights (lb/ft) | | | | |
|-------------|---------------------|-----|-----|-----|-----|
| WTM 40 x | 544 | 476 | 408 | 374 | 340 |
| WTM 36 x | 490 | 429 | 368 | 337 | 306 |
| WTM 32 x | 436 | 381 | 327 | 299 | 272 |
| WTM 28 x | 381 | 333 | 286 | 262 | 238 |
| WTM 24 x | 327 | 286 | 245 | 225 | 204 |



D2 Tower, La Défense
France

European Sections and Merchant Bars

Perfiles europeos y barras comerciales

Kształtowniki europejskie i pręty walcowane

| | | | | | |
|-----|--------------------------------|-----|--|-----|--|
| 46 | Parallel flange I sections IPE | 46 | Perfiles I con alas paralelas IPE | 46 | Dwuteowniki równoległościenne IPE |
| 52 | Wide flange beams HE | 52 | Perfiles de alas anchas HE | 52 | Dwuteowniki szerokostopowe HE |
| 60 | Extra wide flange beams HLZ | 60 | Vigas con alas extra anchas HLZ | 60 | Dwuteowniki szerokostopowe HLZ o ekstra szerokiej stopce |
| 62 | Extra wide flange beams HL | 62 | Vigas con alas extra anchas HL | 62 | Dwuteowniki szerokostopowe HL o ekstra szerokiej stopce |
| 64 | Wide flange columns HD | 64 | Perfiles HD de alas anchas para pilares | 64 | Kształtowniki słupowe szerokostopowe HD |
| 68 | Wide flange bearing piles HP | 68 | Perfiles HP de alas anchas para pilotes | 68 | Pale szerokostopowe HP |
| 70 | Wide flange bearing piles UBP | 70 | Pilotes con alas anchas UBP | 70 | Pale szerokostopowe UBP |
| 72 | Universal beams UB | 72 | Vigas universales UB | 72 | Dwuteowniki uniwersalne UB |
| 84 | Universal columns UC | 84 | Columnas universales UC | 84 | Kształtowniki słupowe uniwersalne UC |
| 88 | Taper flange I sections IPN | 88 | Perfiles I de alas inclinadas IPN | 88 | Dwuteowniki z półkami stożkowymi IPN |
| 90 | Taper flange I sections J | 90 | Perfiles I de alas inclinadas J | 90 | Dwuteowniki z półkami stożkowymi J |
| 92 | Parallel flange channels UPE | 92 | Perfiles en U con alas paralelas UPE | 92 | Ceowniki z półkami równoległymi UPE |
| 94 | Parallel flange channels PFC | 94 | Perfiles en U con alas paralelas PFC | 94 | Ceowniki z półkami równoległymi PFC |
| 96 | Taper flange channels UPN | 96 | Perfiles en U con alas inclinadas UPN | 96 | Ceowniki zwykłe UPN |
| 98 | Equal leg angles L | 98 | L Perfiles angulares de lados iguales | 98 | Kątowniki równoramienne L |
| 106 | Unequal leg angles L | 106 | L Perfiles angulares de lados desiguales | 106 | Kątowniki nierównoramienne L |
| 108 | Square bars | 108 | Barras cuadradas | 108 | Pręty kwadratowe |
| 109 | Hot rolled round steel bars | 109 | Barras redondas de acero laminadas en caliente | 109 | Pręty gładkie okrągłe |

Parallel flange I sections

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles I con alas paralelas

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

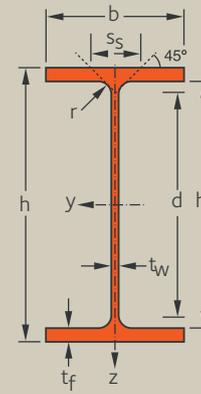
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Dwuteowniki równoległocienne

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Jakość powierzchni: wg. EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenia | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------|----------|---------|----------|---------|---------------------------------------|------------|------------|---|---|----|-------------|-----------------|-------------|---|----|-------------|------------|----|
| | G kg/m | h mm | b mm | tw mm | tf mm | r mm | h1 mm | d mm | A cm² | AL m²/m | Ac m²/t | S355 | | | | S460 | | | | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | |
| IPE 750 x 220 | 40 | 220 | 779,0 | 266,0 | 16,5 | 30,0 | 20 | 719,0 | 679,0 | 280,7 | 2,555 | 11,56 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI |
| IPE 750 x 196 | 196 | | 770,0 | 268,0 | 15,6 | 25,4 | 20 | 719,0 | 679,0 | 250,8 | 2,546 | 12,88 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI |
| IPE 750 x 173 | 173 | | 762,0 | 267,0 | 14,4 | 21,6 | 20 | 719,0 | 679,0 | 221,3 | 2,529 | 14,49 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI |
| IPE 750 x 147 | 147 | | 753,0 | 265,0 | 13,2 | 17,0 | 20 | 719,0 | 679,0 | 187,5 | 2,505 | 16,93 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - |
| IPE 750 x 134 | 134 | | 750,0 | 264,0 | 12,0 | 15,5 | 20 | 719,0 | 679,0 | 170,6 | 2,498 | 18,55 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - |
| IPE V 600 | 40 | 184 | 618,0 | 228,0 | 18,0 | 28,0 | 24 | 562,0 | 514,0 | 233,8 | 2,071 | 11,28 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI |
| IPE O 600 | 40 | 154 | 610,0 | 224,0 | 15,0 | 24,0 | 24 | 562,0 | 514,0 | 196,8 | 2,045 | 13,24 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI |
| IPE 600 | | 122 | 600,0 | 220,0 | 12,0 | 19,0 | 24 | 562,0 | 514,0 | 156,0 | 2,015 | 16,46 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI |
| IPE A 600 | 40 | 108 | 597,0 | 220,0 | 9,8 | 17,5 | 24 | 562,0 | 514,0 | 137,0 | 2,013 | 18,71 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - |
| IPE V 550 | | 159 | 566,0 | 216,0 | 17,1 | 25,2 | 24 | 515,6 | 467,6 | 202,0 | 1,921 | 12,12 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | ✓ | - |
| IPE O 550 | 40 | 123 | 556,0 | 212,0 | 12,7 | 20,2 | 24 | 515,6 | 467,6 | 156,1 | 1,893 | 15,45 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | ✓ |
| IPE 550 | | 106 | 550,0 | 210,0 | 11,1 | 17,2 | 24 | 515,6 | 467,6 | 134,4 | 1,877 | 17,79 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPE A 550 | | 92,1 | 547,0 | 210,0 | 9,0 | 15,7 | 24 | 515,6 | 467,6 | 117,3 | 1,875 | 20,36 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPE AA 550 | | 79,5 | 541,0 | 210,0 | 8,5 | 12,5 | 24 | 515,6 | 467,6 | 101,3 | 1,864 | 23,44 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE V 500 | | 129 | 514,0 | 204,0 | 14,2 | 23,0 | 21 | 468,0 | 426,0 | 164,1 | 1,780 | 13,82 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE O 500 | 40 | 107 | 506,0 | 202,0 | 12,0 | 19,0 | 21 | 468,0 | 426,0 | 136,7 | 1,760 | 16,40 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 500 | | 90,7 | 500,0 | 200,0 | 10,2 | 16,0 | 21 | 468,0 | 426,0 | 115,5 | 1,744 | 19,23 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 500 | | 79,4 | 497,0 | 200,0 | 8,4 | 14,5 | 21 | 468,0 | 426,0 | 101,1 | 1,741 | 21,94 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE AA 500 | | 73,2 | 495,2 | 200,0 | 7,5 | 13,6 | 21 | 468,0 | 426,0 | 93,3 | 1,739 | 23,75 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE V 450 | 40 | 107 | 460,0 | 194,0 | 12,4 | 19,6 | 21 | 420,8 | 378,8 | 132,0 | 1,635 | 15,78 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE O 450 | 40 | 92,4 | 456,0 | 192,0 | 11,0 | 17,6 | 21 | 420,8 | 378,8 | 117,7 | 1,622 | 17,56 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 450 | | 77,6 | 450,0 | 190,0 | 9,4 | 14,6 | 21 | 420,8 | 378,8 | 98,8 | 1,605 | 20,69 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 450 | | 67,2 | 447,0 | 190,0 | 7,6 | 13,1 | 21 | 420,8 | 378,8 | 85,6 | 1,603 | 23,87 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE AA 450 | | 62,1 | 445,4 | 190,0 | 6,8 | 12,3 | 21 | 420,8 | 378,8 | 79,1 | 1,601 | 25,77 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE V 400 | 40 | 84,0 | 408,0 | 182,0 | 10,6 | 17,5 | 21 | 373,0 | 331,0 | 107,0 | 1,487 | 17,70 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE O 400 | 40 | 75,7 | 404,0 | 182,0 | 9,7 | 15,5 | 21 | 373,0 | 331,0 | 96,4 | 1,481 | 19,57 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 400 | | 66,3 | 400,0 | 180,0 | 8,6 | 13,5 | 21 | 373,0 | 331,0 | 84,5 | 1,467 | 22,13 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 400 | | 57,4 | 397,0 | 180,0 | 7,0 | 12,0 | 21 | 373,0 | 331,0 | 73,1 | 1,464 | 25,51 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE AA 400 | | 53,4 | 395,6 | 180,0 | 6,3 | 11,3 | 21 | 373,0 | 331,0 | 68,0 | 1,463 | 27,42 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.
 Minimum tonnage and delivery conditions upon agreement.
 Dimensions ArcelorMittal standard

40 Pedido mínimo: 40t por sección y grado o previo acuerdo
 Plazo mínimo y condiciones de entrega previo acuerdo
 Dimensiones estándar de ArcelorMittal

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
 Minimalny tonaż i warunki dostawy po uzgodnieniu.
 Wymiary standard ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | |
|---|---|-----------------|-----------|-----------------|-----------------|-----------------|---|-----------|-------|-----------------|-----------------|------------------|------------------------|------------------------------------|---------------------|-----------|-----------------------|--|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | S_{355} | S_{460} | S_{355} | S_{460} | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| kg/m | cm ⁴ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | | |
| IPE 750 x 220 | 220 | 279390 | 7173 | 8231 | 31,4 | 139,0 | 9443 | 710,0 | 1114 | 5,7 | 9,9 | 620,5 | 13190 | 1 | 1 | 4 | 4 | 81 | 91 | 65 | 74 |
| IPE 750 x 196 | 196 | 241470 | 6271 | 7207 | 30,9 | 129,7 | 8177 | 610,2 | 960,1 | 5,6 | 8,9 | 416,5 | 11290 | 1 | 1 | 4 | 4 | 90 | 101 | 72 | 82 |
| IPE 750 x 173 | 173 | 207010 | 5433 | 6251 | 30,5 | 118,6 | 6875 | 515,0 | 811,1 | 5,5 | 8,1 | 278,7 | 9390 | 1 | 1 | 4 | 4 | 102 | 114 | 81 | 93 |
| IPE 750 x 147 | 147 | 167250 | 4442 | 5143 | 29,7 | 107,3 | 5291 | 399,3 | 632,0 | 5,2 | 7,0 | 163,2 | 7140 | 1 | 1 | 4 | 4 | 119 | 133 | 94 | 108 |
| IPE 750 x 134 | 134 | 151890 | 4050 | 4678 | 29,7 | 97,77 | 4767 | 361,2 | 569,6 | 5,2 | 6,6 | 124,9 | 6410 | 1 | 2 | 4 | 4 | 130 | 146 | 103 | 118 |
| IPE V 600 | 184 | 141580 | 4581 | 5324 | 24,6 | 124,5 | 5569 | 488,5 | 780,3 | 4,8 | 10,2 | 505,8 | 4813 | 1 | 1 | 2 | 3 | 79 | 89 | 63 | 72 |
| IPE O 600 | 154 | 118300 | 3878 | 4471 | 24,5 | 104,3 | 4520 | 403,6 | 640,0 | 4,7 | 9,1 | 316,3 | 3859 | 1 | 1 | 4 | 4 | 93 | 104 | 73 | 85 |
| IPE 600 | 122 | 92080 | 3069 | 3512 | 24,2 | 83,78 | 3387 | 307,9 | 485,6 | 4,6 | 7,8 | 165,2 | 2845 | 1 | 1 | 4 | 4 | 115 | 129 | 91 | 105 |
| IPE A 600 | 108 | 82910 | 2777 | 3141 | 24,5 | 70,13 | 3116 | 283,2 | 442,0 | 4,7 | 7,2 | 122,1 | 2607 | 1 | 2 | 4 | 4 | 131 | 147 | 103 | 119 |
| IPE V 550 | 159 | 102330 | 3616 | 4204 | 22,5 | 109,5 | 4264 | 394,8 | 632,4 | 4,5 | 9,5 | 372,4 | 3094 | 1 | - | 2 | - | 84 | 95 | 67 | 77 |
| IPE O 550 | 123 | 79150 | 2847 | 3263 | 22,5 | 82,68 | 3224 | 304,1 | 480,5 | 4,5 | 8,1 | 187,1 | 2302 | 1 | 1 | 4 | 4 | 108 | 121 | 85 | 98 |
| IPE 550 | 106 | 67110 | 2440 | 2787 | 22,3 | 72,34 | 2667 | 254,0 | 400,5 | 4,4 | 7,3 | 122,8 | 1884 | 1 | 1 | 4 | 4 | 124 | 140 | 97 | 113 |
| IPE A 550 | 92,1 | 59970 | 2193 | 2474 | 22,6 | 60,29 | 2432 | 231,6 | 361,5 | 4,5 | 6,8 | 89,29 | 1710 | 1 | 2 | 4 | 4 | 142 | 160 | 111 | 129 |
| IPE AA 550 | 79,5 | 49550 | 1831 | 2078 | 22,1 | 55,86 | 1937 | 184,5 | 289,6 | 4,3 | 6,1 | 56,18 | 1347 | 1 | 2 | 4 | 4 | 163 | 184 | 128 | 148 |
| IPE V 500 | 129 | 70710 | 2751 | 3168 | 20,7 | 83,16 | 3271 | 320,7 | 506,6 | 4,4 | 8,4 | 241,5 | 1961 | 1 | 1 | 2 | 3 | 96 | 108 | 75 | 88 |
| IPE O 500 | 107 | 57770 | 2283 | 2612 | 20,5 | 70,20 | 2621 | 259,5 | 408,5 | 4,3 | 7,4 | 142,7 | 1547 | 1 | 1 | 4 | 4 | 114 | 129 | 89 | 104 |
| IPE 500 | 90,7 | 48190 | 1927 | 2194 | 20,4 | 59,87 | 2141 | 214,1 | 335,8 | 4,3 | 6,6 | 89,09 | 1249 | 1 | 1 | 4 | 4 | 134 | 151 | 104 | 121 |
| IPE A 500 | 79,4 | 42930 | 1727 | 1946 | 20,6 | 50,40 | 1939 | 193,9 | 301,6 | 4,3 | 6,2 | 64,28 | 1125 | 1 | 1 | 4 | 4 | 152 | 172 | 118 | 138 |
| IPE AA 500 | 73,2 | 39940 | 1613 | 1807 | 20,6 | 45,61 | 1818 | 181,8 | 281,7 | 4,4 | 5,9 | 52,86 | 1051 | 1 | 2 | 4 | 4 | 165 | 186 | 128 | 149 |
| IPE V 450 | 107 | 46200 | 2008 | 2301 | 18,7 | 66,62 | 2396 | 247,1 | 389,1 | 4,2 | 7,6 | 148,8 | 1156 | 1 | 1 | 2 | 4 | 109 | 124 | 84 | 99 |
| IPE O 450 | 92,4 | 40920 | 1794 | 2046 | 18,6 | 59,40 | 2085 | 217,2 | 340,9 | 4,2 | 7,0 | 108,9 | 997,5 | 1 | 1 | 4 | 4 | 122 | 138 | 94 | 110 |
| IPE 450 | 77,6 | 33740 | 1499 | 1701 | 18,4 | 50,84 | 1675 | 176,4 | 276,3 | 4,1 | 6,3 | 66,74 | 791 | 1 | 1 | 4 | 4 | 143 | 162 | 110 | 130 |
| IPE A 450 | 67,2 | 29750 | 1331 | 1494 | 18,6 | 42,26 | 1502 | 158,1 | 245,7 | 4,1 | 5,8 | 47,13 | 704,8 | 1 | 1 | 4 | 4 | 165 | 187 | 127 | 149 |
| IPE AA 450 | 62,1 | 27740 | 1246 | 1391 | 18,7 | 38,40 | 1410 | 148,4 | 229,9 | 4,2 | 5,6 | 39,16 | 659,3 | 1 | 2 | 4 | 4 | 178 | 202 | 137 | 161 |
| IPE V 400 | 84,0 | 30130 | 1477 | 1681 | 16,7 | 52,52 | 1766 | 194,1 | 304,0 | 4,0 | 7,0 | 99,58 | 670,3 | 1 | 1 | 3 | 4 | 122 | 139 | 93 | 110 |
| IPE O 400 | 75,7 | 26740 | 1324 | 1502 | 16,6 | 47,98 | 1564 | 171,8 | 269,0 | 4,0 | 6,5 | 73,34 | 587,6 | 1 | 1 | 3 | 4 | 135 | 154 | 103 | 122 |
| IPE 400 | 66,3 | 23120 | 1156 | 1307 | 16,5 | 42,69 | 1317 | 146,4 | 229,0 | 3,9 | 6,0 | 51,27 | 490 | 1 | 1 | 4 | 4 | 152 | 174 | 116 | 137 |
| IPE A 400 | 57,4 | 20290 | 1022 | 1143 | 16,6 | 35,77 | 1170 | 130,0 | 202,0 | 4,0 | 5,5 | 36,16 | 432,2 | 1 | 1 | 4 | 4 | 176 | 200 | 133 | 158 |
| IPE AA 400 | 53,4 | 19000 | 960,5 | 1069 | 16,7 | 32,74 | 1102 | 122,4 | 189,7 | 4,0 | 5,3 | 30,53 | 405,5 | 1 | 2 | 4 | 4 | 189 | 215 | 143 | 169 |

Parallel flange I sections (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles I con alas paralelas (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

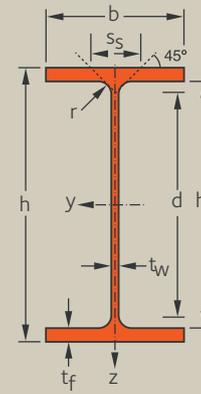
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Dwuteowniki równoległocienne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------|----------|---------|----------|---------------------------------------|----------------------|-------------------------|---|-------------|---|----|-------------|-----------------|-------------|---|----|-------------|------------|---|
| | G kg/m | h mm | b mm | tw mm | tf mm | r mm | h1 mm | d mm | A cm ² | AL m ² /m | Ac m ² /t | S355 | | | | S460 | | | | | | |
| | | | | | | | | | | | | JR/IO/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/IO/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | |
| IPE O 360 | 40 | 66,0 | 364,0 | 172,0 | 9,2 | 14,7 | 18 | 334,6 | 298,6 | 84,1 | 1,367 | 20,70 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 360 | | 57,1 | 360,0 | 170,0 | 8,0 | 12,7 | 18 | 334,6 | 298,6 | 72,7 | 1,353 | 23,70 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 360 | | 50,2 | 357,6 | 170,0 | 6,6 | 11,5 | 18 | 334,6 | 298,6 | 64,0 | 1,351 | 26,91 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE AA 360 | ◆ | 47,0 | 356,4 | 170,0 | 6,0 | 10,9 | 18 | 334,6 | 298,6 | 59,9 | 1,350 | 28,70 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE O 330 | 40 | 57,0 | 334,0 | 162,0 | 8,5 | 13,5 | 18 | 307,0 | 271,0 | 72,6 | 1,268 | 22,24 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 330 | | 49,1 | 330,0 | 160,0 | 7,5 | 11,5 | 18 | 307,0 | 271,0 | 62,6 | 1,254 | 25,52 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 330 | | 43,0 | 327,0 | 160,0 | 6,5 | 10,0 | 18 | 307,0 | 271,0 | 54,7 | 1,250 | 29,09 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE O 300 | 40 | 49,3 | 304,0 | 152,0 | 8,0 | 12,7 | 15 | 278,6 | 248,6 | 62,8 | 1,174 | 23,80 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 300 | | 42,2 | 300,0 | 150,0 | 7,1 | 10,7 | 15 | 278,6 | 248,6 | 53,8 | 1,160 | 27,46 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 300 | | 36,5 | 297,0 | 150,0 | 6,1 | 9,2 | 15 | 278,6 | 248,6 | 46,5 | 1,156 | 31,65 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE O 270 | 40 | 42,3 | 274,0 | 136,0 | 7,5 | 12,2 | 15 | 249,6 | 219,6 | 53,8 | 1,051 | 24,87 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 270 | | 36,1 | 270,0 | 135,0 | 6,6 | 10,2 | 15 | 249,6 | 219,6 | 45,9 | 1,041 | 28,86 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE A 270 | | 30,7 | 267,0 | 135,0 | 5,5 | 8,7 | 15 | 249,6 | 219,6 | 39,2 | 1,037 | 33,74 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE O 240 | 40 | 34,3 | 242,0 | 122,0 | 7,0 | 10,8 | 15 | 220,4 | 190,4 | 43,7 | 0,932 | 27,16 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 240 | | 30,7 | 240,0 | 120,0 | 6,2 | 9,8 | 15 | 220,4 | 190,4 | 39,1 | 0,922 | 30,03 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 240 | | 26,2 | 237,0 | 120,0 | 5,2 | 8,3 | 15 | 220,4 | 190,4 | 33,3 | 0,918 | 35,11 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE AA 240 | | 24,9 | 236,4 | 120,0 | 4,8 | 8,0 | 15 | 220,4 | 190,4 | 31,7 | 0,917 | 36,84 | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - |
| IPE O 220 | 40 | 29,4 | 222,0 | 112,0 | 6,6 | 10,2 | 12 | 201,6 | 177,6 | 37,4 | 0,858 | 29,23 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 220 | | 26,2 | 220,0 | 110,0 | 5,9 | 9,2 | 12 | 201,6 | 177,6 | 33,4 | 0,848 | 32,37 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 220 | | 22,2 | 217,0 | 110,0 | 5,0 | 7,7 | 12 | 201,6 | 177,6 | 28,3 | 0,843 | 38,01 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE AA 220 | | 21,2 | 216,4 | 110,0 | 4,7 | 7,4 | 12 | 201,6 | 177,6 | 27,0 | 0,843 | 39,79 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE O 200 | 40 | 25,1 | 202,0 | 102,0 | 6,2 | 9,5 | 12 | 183,0 | 159,0 | 32,0 | 0,779 | 31,05 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 200 | | 22,4 | 200,0 | 100,0 | 5,6 | 8,5 | 12 | 183,0 | 159,0 | 28,5 | 0,768 | 34,35 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 200 | | 18,4 | 197,0 | 100,0 | 4,5 | 7,0 | 12 | 183,0 | 159,0 | 23,5 | 0,764 | 41,47 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE AA 200 | | 18,0 | 196,4 | 100,0 | 4,5 | 6,7 | 12 | 183,0 | 159,0 | 22,9 | 0,763 | 42,50 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE O 180 | 40 | 21,3 | 182,0 | 92,0 | 6,0 | 9,0 | 9 | 164,0 | 146,0 | 27,1 | 0,705 | 33,15 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ |
| IPE 180 | | 18,8 | 180,0 | 91,0 | 5,3 | 8,0 | 9 | 164,0 | 146,0 | 23,9 | 0,698 | 37,13 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ |
| IPE A 180 | | 15,4 | 177,0 | 91,0 | 4,3 | 6,5 | 9 | 164,0 | 146,0 | 19,6 | 0,694 | 45,16 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE AA 180 | | 14,9 | 176,4 | 91,0 | 4,3 | 6,2 | 9 | 164,0 | 146,0 | 19,0 | 0,693 | 46,39 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |

40 Minimum order: 40t per section and grade or upon agreement.
 ◆ Minimum tonnage and delivery conditions upon agreement.
 ◆ Dimensions ArcelorMittal standard

40 Pedido mínimo: 40t por sección y grado o previo acuerdo
 ◆ Plazo mínimo y condiciones de entrega previo acuerdo
 ◆ Dimensiones estándar de ArcelorMittal

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
 ◆ Minimalny tonaż i warunki dostawy po uzgodnieniu.
 ◆ Wymiary standard ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ³] | | | | |
|---|---|-----------------|------------------|------------------|-----------------|-----------------|---|------------------|------------------|----------------|-----------------|-----------------|------------------------------------|------|---------------------|------|--|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | G | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | |
| IPE O 360 | 66,0 | 19040 | 1046 | 1186 | 15,0 | 40,20 | 1251 | 145,4 | 226,9 | 3,8 | 5,9 | 55,74 | 380,2 | 1 | 1 | 3 | 4 | 142 | 162 | 107 | 127 |
| IPE 360 | 57,1 | 16260 | 903,6 | 1019 | 14,9 | 35,13 | 1043 | 122,7 | 191,0 | 3,7 | 5,4 | 37,44 | 313,5 | 1 | 1 | 4 | 4 | 163 | 186 | 122 | 146 |
| IPE A 360 | 50,2 | 14510 | 811,8 | 906,7 | 15,0 | 29,76 | 944,2 | 111,0 | 171,8 | 3,8 | 5,0 | 27,36 | 281,9 | 1 | 1 | 4 | 4 | 185 | 211 | 138 | 165 |
| IPE AA 360 | 47,0 | 13670 | 767,5 | 853,5 | 15,1 | 27,43 | 894,8 | 105,2 | 162,4 | 3,8 | 4,8 | 23,37 | 266,3 | 1 | 1 | 4 | 4 | 197 | 225 | 147 | 176 |
| IPE O 330 | 57,0 | 13910 | 832,9 | 942,7 | 13,8 | 34,88 | 960,3 | 118,5 | 184,9 | 3,6 | 5,6 | 42,20 | 245,6 | 1 | 1 | 3 | 4 | 152 | 175 | 114 | 137 |
| IPE 330 | 49,1 | 11760 | 713,1 | 804,3 | 13,7 | 30,80 | 788,1 | 98,51 | 153,6 | 3,5 | 5,1 | 28,06 | 199,0 | 1 | 1 | 4 | 4 | 175 | 200 | 131 | 157 |
| IPE A 330 | 43,0 | 10230 | 625,7 | 701,9 | 13,6 | 26,98 | 685,1 | 85,64 | 133,2 | 3,5 | 4,7 | 19,63 | 171,5 | 1 | 1 | 4 | 4 | 199 | 228 | 149 | 178 |
| IPE O 300 | 49,3 | 9994 | 657,5 | 743,8 | 12,6 | 29,04 | 745,7 | 98,12 | 152,5 | 3,4 | 5,0 | 30,97 | 157,6 | 1 | 1 | 3 | 4 | 163 | 187 | 121 | 145 |
| IPE 300 | 42,2 | 8356 | 557,0 | 628,3 | 12,4 | 25,68 | 603,7 | 80,50 | 125,2 | 3,3 | 4,6 | 19,91 | 125,9 | 1 | 1 | 4 | 4 | 188 | 216 | 139 | 167 |
| IPE A 300 | 36,5 | 7173 | 483,0 | 541,7 | 12,4 | 22,24 | 518,9 | 69,19 | 107,3 | 3,3 | 4,2 | 13,34 | 107,1 | 1 | 1 | 4 | 4 | 216 | 248 | 160 | 192 |
| IPE O 270 | 42,3 | 6947 | 507,0 | 574,6 | 11,3 | 25,22 | 513,4 | 75,51 | 117,7 | 3,0 | 4,9 | 24,98 | 87,64 | 1 | 1 | 2 | 3 | 170 | 195 | 127 | 152 |
| IPE 270 | 36,1 | 5789 | 428,8 | 483,9 | 11,2 | 22,13 | 419,8 | 62,20 | 96,95 | 3,0 | 4,4 | 15,90 | 70,57 | 1 | 1 | 3 | 4 | 197 | 227 | 147 | 176 |
| IPE A 270 | 30,7 | 4917 | 368,3 | 412,4 | 11,2 | 18,74 | 357,9 | 53,03 | 82,34 | 3,0 | 4,0 | 10,41 | 59,50 | 1 | 1 | 4 | 4 | 230 | 265 | 171 | 205 |
| IPE O 240 | 34,3 | 4369 | 361,0 | 410,2 | 9,9 | 21,35 | 328,5 | 53,85 | 84,39 | 2,7 | 4,6 | 17,09 | 43,67 | 1 | 1 | 2 | 3 | 185 | 213 | 139 | 167 |
| IPE 240 | 30,7 | 3891 | 324,3 | 366,6 | 9,9 | 19,14 | 283,6 | 47,27 | 73,92 | 2,6 | 4,3 | 12,95 | 37,39 | 1 | 1 | 2 | 4 | 205 | 236 | 153 | 184 |
| IPE A 240 | 26,2 | 3290 | 277,6 | 311,5 | 9,9 | 16,31 | 240,1 | 40,02 | 62,39 | 2,6 | 3,9 | 8,503 | 31,25 | 1 | 1 | 4 | 4 | 240 | 276 | 178 | 214 |
| IPE AA 240 | 24,9 | 3153 | 266,8 | 298,1 | 9,9 | 15,29 | 231,3 | 38,56 | 59,98 | 2,7 | 3,8 | 7,608 | 30,04 | 1 | - | 4 | - | 251 | 289 | 187 | 225 |
| IPE O 220 | 29,4 | 3134 | 282,3 | 321,1 | 9,1 | 17,66 | 239,8 | 42,82 | 66,90 | 2,5 | 4,1 | 12,16 | 26,78 | 1 | 1 | 2 | 2 | 200 | 230 | 149 | 179 |
| IPE 220 | 26,2 | 2771 | 251,9 | 285,4 | 9,1 | 15,88 | 204,8 | 37,25 | 58,11 | 2,4 | 3,8 | 9,030 | 22,67 | 1 | 1 | 2 | 4 | 221 | 254 | 165 | 198 |
| IPE A 220 | 22,2 | 2316 | 213,5 | 240,2 | 9,0 | 13,54 | 171,4 | 31,16 | 48,48 | 2,4 | 3,4 | 5,679 | 18,70 | 1 | 1 | 4 | 4 | 260 | 298 | 193 | 231 |
| IPE AA 220 | 21,2 | 2218 | 205,0 | 230,0 | 9,0 | 12,83 | 164,7 | 29,94 | 46,50 | 2,4 | 3,3 | 5,056 | 17,92 | 1 | 1 | 4 | 4 | 271 | 312 | 201 | 242 |
| IPE O 200 | 25,1 | 2211 | 218,9 | 249,4 | 8,3 | 15,45 | 168,8 | 33,11 | 51,89 | 2,2 | 3,9 | 9,357 | 15,56 | 1 | 1 | 1 | 2 | 212 | 244 | 158 | 190 |
| IPE 200 | 22,4 | 1943 | 194,3 | 220,6 | 8,2 | 14,00 | 142,3 | 28,47 | 44,61 | 2,2 | 3,6 | 6,915 | 12,98 | 1 | 1 | 2 | 3 | 235 | 270 | 176 | 211 |
| IPE A 200 | 18,4 | 1591 | 161,5 | 181,6 | 8,2 | 11,46 | 117,1 | 23,43 | 36,53 | 2,2 | 3,2 | 4,135 | 10,52 | 1 | 1 | 4 | 4 | 283 | 326 | 210 | 253 |
| IPE AA 200 | 18,0 | 1533 | 156,1 | 175,7 | 8,1 | 11,38 | 112,1 | 22,43 | 35,03 | 2,2 | 3,1 | 3,808 | 10,04 | 1 | 1 | 4 | 4 | 290 | 334 | 215 | 259 |
| IPE O 180 | 21,3 | 1505 | 165,4 | 189,1 | 7,4 | 12,69 | 117,2 | 25,49 | 39,91 | 2,0 | 3,4 | 6,647 | 8,739 | 1 | 1 | 1 | 2 | 226 | 260 | 168 | 202 |
| IPE 180 | 18,8 | 1316 | 146,3 | 166,4 | 7,4 | 11,25 | 100,8 | 22,16 | 34,59 | 2,0 | 3,1 | 4,726 | 7,431 | 1 | 1 | 2 | 3 | 253 | 291 | 188 | 226 |
| IPE A 180 | 15,4 | 1062 | 120,0 | 135,3 | 7,3 | 9,196 | 81,88 | 17,99 | 27,96 | 2,0 | 2,7 | 2,673 | 5,933 | 1 | 1 | 3 | 4 | 308 | 354 | 227 | 274 |
| IPE AA 180 | 14,9 | 1020 | 115,6 | 130,5 | 7,3 | 9,129 | 78,11 | 17,16 | 26,71 | 2,0 | 2,7 | 2,431 | 5,639 | 1 | 1 | 3 | 4 | 316 | 364 | 233 | 281 |

Parallel flange I sections (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles I con alas paralelas (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

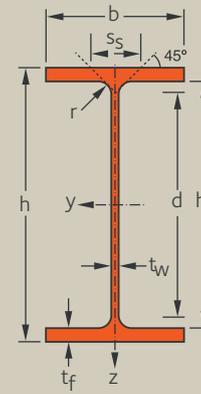
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Dwuteowniki równoległościenne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------|----------|---------|----------|---------|---------------------------------------|-------------------------|-------------------------|---|---|----|-------------|-----------------|-------------|---|----|-------------|------------|
| | G kg/m | h mm | b mm | tw mm | tf mm | r mm | h1 mm | d mm | A cm ² | AL m ² /m | Ac m ² /t | S355 | | | | S460 | | | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 |
| IPE 160 | 15,8 | 160,0 | 82,0 | 5,0 | 7,4 | 9 | 145,2 | 127,2 | 20,1 | 0,623 | 39,50 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE A 160 | 12,7 | 157,0 | 82,0 | 4,0 | 5,9 | 9 | 145,2 | 127,2 | 16,2 | 0,619 | 48,74 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE AA 160 | 12,3 | 156,4 | 82,0 | 4,0 | 5,6 | 9 | 145,2 | 127,2 | 15,7 | 0,617 | 50,10 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE 140 | 12,9 | 140,0 | 73,0 | 4,7 | 6,9 | 7 | 126,2 | 112,2 | 16,4 | 0,551 | 42,73 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE A 140 | 10,5 | 137,4 | 73,0 | 3,8 | 5,6 | 7 | 126,2 | 112,2 | 13,4 | 0,547 | 52,03 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE AA 140 | 10,1 | 136,6 | 73,0 | 3,8 | 5,2 | 7 | 126,2 | 112,2 | 12,8 | 0,546 | 54,30 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE 120 | 10,4 | 120,0 | 64,0 | 4,4 | 6,3 | 7 | 107,4 | 93,4 | 13,2 | 0,475 | 45,81 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE A 120 | 8,7 | 117,6 | 64,0 | 3,8 | 5,1 | 7 | 107,4 | 93,4 | 11,0 | 0,472 | 54,51 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE AA 120 | 8,4 | 117,0 | 64,0 | 3,8 | 4,8 | 7 | 107,4 | 93,4 | 10,7 | 0,470 | 56,24 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE 100 | 8,1 | 100,0 | 55,0 | 4,1 | 5,7 | 7 | 88,6 | 74,6 | 10,3 | 0,400 | 49,36 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE A 100 | 6,9 | 98,0 | 55,0 | 3,6 | 4,7 | 7 | 88,6 | 74,6 | 8,8 | 0,397 | 57,60 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE AA 100 | 6,7 | 97,6 | 55,0 | 3,6 | 4,5 | 7 | 88,6 | 74,6 | 8,6 | 0,396 | 58,93 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE 80 | 6,0 | 80,0 | 46,0 | 3,8 | 5,2 | 5 | 69,6 | 59,6 | 7,6 | 0,328 | 54,67 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - |
| IPE A 80 | 5,0 | 78,0 | 46,0 | 3,3 | 4,2 | 5 | 69,6 | 59,6 | 6,4 | 0,325 | 64,94 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |
| IPE AA 80 | 4,9 | 78,0 | 46,0 | 3,2 | 4,2 | 5 | 69,6 | 59,6 | 6,3 | 0,325 | 65,66 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkładniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V[m-1] | | | | |
|---|---|-----------------|-----------------|-------|-----------------|---|-----------------|-----------------|-------|-------|------------------------|-----------------|------------------------------------|-----------|-----------------------|-----------|---|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | S_{355} | S_{460} | S_{355} | S_{460} | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | |
| IPE 160 | 15,8 | 869,2 | 108,6 | 123,8 | 6,5 | 9,657 | 68,31 | 16,66 | 26,09 | 1,8 | 3,0 | 3,540 | 3,958 | 1 | 1 | 1 | 2 | 269 | 310 | 200 | 241 |
| IPE A 160 | 12,7 | 689,2 | 87,80 | 99,09 | 6,5 | 7,801 | 54,42 | 13,27 | 20,69 | 1,8 | 2,6 | 1,934 | 3,094 | 1 | 1 | 3 | 4 | 332 | 382 | 245 | 295 |
| IPE AA 160 | 12,3 | 659,0 | 84,28 | 95,23 | 6,4 | 7,735 | 51,66 | 12,60 | 19,68 | 1,8 | 2,5 | 1,749 | 2,925 | 1 | 1 | 3 | 4 | 341 | 394 | 252 | 304 |
| IPE 140 | 12,9 | 541,2 | 77,31 | 88,34 | 5,7 | 7,642 | 44,91 | 12,30 | 19,24 | 1,6 | 2,6 | 2,399 | 1,981 | 1 | 1 | 1 | 2 | 291 | 335 | 215 | 259 |
| IPE A 140 | 10,5 | 434,8 | 63,29 | 71,59 | 5,6 | 6,213 | 36,42 | 9,979 | 15,52 | 1,6 | 2,3 | 1,338 | 1,576 | 1 | 1 | 2 | 3 | 354 | 409 | 260 | 314 |
| IPE AA 140 | 10,1 | 407,4 | 59,65 | 67,59 | 5,6 | 6,141 | 33,83 | 9,268 | 14,45 | 1,6 | 2,2 | 1,153 | 1,455 | 1 | 1 | 2 | 3 | 369 | 426 | 270 | 327 |
| IPE 120 | 10,4 | 317,7 | 52,95 | 60,72 | 4,9 | 6,305 | 27,66 | 8,646 | 13,58 | 1,4 | 2,5 | 1,690 | 0,889 | 1 | 1 | 1 | 1 | 311 | 360 | 230 | 279 |
| IPE A 120 | 8,7 | 257,3 | 43,76 | 49,87 | 4,8 | 5,409 | 22,38 | 6,996 | 10,97 | 1,4 | 2,2 | 0,996 | 0,705 | 1 | 1 | 1 | 2 | 370 | 428 | 271 | 329 |
| IPE AA 120 | 8,4 | 244,1 | 41,73 | 47,61 | 4,7 | 5,356 | 21,07 | 6,586 | 10,36 | 1,4 | 2,1 | 0,889 | 0,660 | 1 | 1 | 1 | 2 | 382 | 442 | 280 | 340 |
| IPE 100 | 8,1 | 171,0 | 34,20 | 39,40 | 4,0 | 5,084 | 15,91 | 5,788 | 9,145 | 1,2 | 2,3 | 1,157 | 0,351 | 1 | 1 | 1 | 1 | 334 | 387 | 247 | 300 |
| IPE A 100 | 6,9 | 141,1 | 28,80 | 32,98 | 4,0 | 4,437 | 13,12 | 4,771 | 7,537 | 1,2 | 2,1 | 0,726 | 0,283 | 1 | 1 | 1 | 1 | 389 | 452 | 286 | 349 |
| IPE AA 100 | 6,7 | 135,8 | 27,84 | 31,90 | 3,9 | 4,402 | 12,56 | 4,569 | 7,234 | 1,2 | 2,0 | 0,672 | 0,270 | 1 | 1 | 1 | 1 | 398 | 463 | 292 | 357 |
| IPE 80 | 6,0 | 80,13 | 20,03 | 23,21 | 3,2 | 3,577 | 8,489 | 3,690 | 5,817 | 1,0 | 2,0 | 0,672 | 0,117 | 1 | 1 | 1 | 1 | 369 | 429 | 270 | 330 |
| IPE A 80 | 5,0 | 64,37 | 16,50 | 18,97 | 3,1 | 3,070 | 6,852 | 2,979 | 4,692 | 1,0 | 1,7 | 0,392 | 0,092 | 1 | 1 | 1 | 1 | 437 | 509 | 317 | 389 |
| IPE AA 80 | 4,9 | 64,09 | 16,43 | 18,85 | 3,1 | 2,996 | 6,850 | 2,978 | 4,680 | 1,0 | 1,7 | 0,383 | 0,092 | 1 | 1 | 1 | 1 | 442 | 515 | 320 | 393 |

Wide flange beams

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles de alas anchas

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

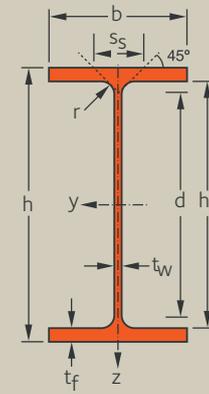
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki szerokostopowe

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------|----------|---------|----------|---------------------------------------|----------|------------|---|-------------|---|----|-------------|-----------------|-------------|---|----|-------------|------------|--------|----|---|
| | G kg/m | h mm | b mm | tw mm | tf mm | r mm | h1 mm | d mm | A cm² | AL m²/m | Ac m²/t | S355 | | | | | S460 | | | | | S500 | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML | |
| HE 1000 x 584 | 40 | 584 | 1056,0 | 314,0 | 36,0 | 64,0 | 30 | 928,0 | 868,0 | 743,7 | 3,244 | 5,556 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HE 1000 x 494 | 40 | 494 | 1036,0 | 309,0 | 31,0 | 54,0 | 30 | 928,0 | 868,0 | 629,1 | 3,194 | 6,467 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HE 1000 x 438 | 40 | 438 | 1026,0 | 305,0 | 26,9 | 49,0 | 30 | 928,0 | 868,0 | 556,0 | 3,167 | 7,253 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HE 1000 x 415 | 40 | 415 | 1020,0 | 304,0 | 26,0 | 46,0 | 30 | 928,0 | 868,0 | 528,7 | 3,152 | 7,595 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HE 1000 x 393 | 40 | 393 | 1016,0 | 303,0 | 24,4 | 43,9 | 30 | 928,0 | 868,0 | 500,2 | 3,144 | 8,006 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HE 1000 M | | 349 | 1008,0 | 302,0 | 21,0 | 40,0 | 30 | 928,0 | 868,0 | 444,2 | 3,130 | 8,976 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 1000 B | | 314 | 1000,0 | 300,0 | 19,0 | 36,0 | 30 | 928,0 | 868,0 | 400,0 | 3,110 | 9,903 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 1000 A | | 272 | 990,0 | 300,0 | 16,5 | 31,0 | 30 | 928,0 | 868,0 | 346,8 | 3,095 | 11,37 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 1000 x 249 | 40 | 249 | 980,0 | 300,0 | 16,5 | 26,0 | 30 | 928,0 | 868,0 | 316,8 | 3,075 | 12,36 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 1000 AA | 40 | 222 | 970,0 | 300,0 | 16,0 | 21,0 | 30 | 928,0 | 868,0 | 282,2 | 3,056 | 13,79 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | ✓ | - | ✓ | - |
| HE 900 x 466 | | 466 | 938,0 | 312,0 | 30,0 | 54,0 | 30 | 830,0 | 770,0 | 593,7 | 3,012 | 6,463 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HE 900 x 391 | | 391 | 922,0 | 307,0 | 25,0 | 46,0 | 30 | 830,0 | 770,0 | 497,7 | 2,970 | 7,602 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HE 900 M | | 333 | 910,0 | 302,0 | 21,0 | 40,0 | 30 | 830,0 | 770,0 | 423,6 | 2,934 | 8,823 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 900 B | | 291 | 900,0 | 300,0 | 18,5 | 35,0 | 30 | 830,0 | 770,0 | 371,3 | 2,911 | 9,988 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 900 A | | 252 | 890,0 | 300,0 | 16,0 | 30,0 | 30 | 830,0 | 770,0 | 320,5 | 2,896 | 11,51 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 900 AA | 40 | 198 | 870,0 | 300,0 | 15,0 | 20,0 | 30 | 830,0 | 770,0 | 252,2 | 2,858 | 14,43 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - |
| HE 800 x 444 | | 444 | 842,0 | 313,0 | 30,0 | 54,0 | 30 | 734,0 | 674,0 | 566,0 | 2,824 | 6,356 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 800 x 373 | | 373 | 826,0 | 308,0 | 25,0 | 46,0 | 30 | 734,0 | 674,0 | 474,6 | 2,782 | 7,467 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 800 M | | 317 | 814,0 | 303,0 | 21,0 | 40,0 | 30 | 734,0 | 674,0 | 404,3 | 2,746 | 8,653 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 800 B | | 262 | 800,0 | 300,0 | 17,5 | 33,0 | 30 | 734,0 | 674,0 | 334,2 | 2,713 | 10,34 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 800 A | | 224 | 790,0 | 300,0 | 15,0 | 28,0 | 30 | 734,0 | 674,0 | 285,8 | 2,698 | 12,02 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 800 AA | 40 | 172 | 770,0 | 300,0 | 14,0 | 18,0 | 30 | 734,0 | 674,0 | 218,5 | 2,660 | 15,51 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - |
| HE 700 x 418 | | 418 | 744,0 | 313,0 | 29,5 | 54,0 | 27 | 636,0 | 582,0 | 531,9 | 2,635 | 6,311 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 700 x 352 | | 352 | 728,0 | 308,0 | 25,0 | 46,0 | 27 | 636,0 | 582,0 | 448,6 | 2,592 | 7,360 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 700 M | | 301 | 716,0 | 304,0 | 21,0 | 40,0 | 27 | 636,0 | 582,0 | 383,0 | 2,560 | 8,514 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 700 B | | 241 | 700,0 | 300,0 | 17,0 | 32,0 | 27 | 636,0 | 582,0 | 306,4 | 2,520 | 10,48 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 700 A | | 204 | 690,0 | 300,0 | 14,5 | 27,0 | 27 | 636,0 | 582,0 | 260,5 | 2,505 | 12,25 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 700 AA | 40 | 150 | 670,0 | 300,0 | 13,0 | 17,0 | 27 | 636,0 | 582,0 | 190,9 | 2,468 | 16,47 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.
Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.
Plazo mínimo y condiciones de entrega previo acuerdo

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
Minimalny tonaż i warunki dostawy po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju $A_p/V [m^{-1}]$ | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-----------------|------------------------|------------------------------------|---------------------|-----------|-----------------------|--|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | S_{355} | S_{460} | S_{355} | S_{460} | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | |
| HE 1000 x 584 | 584 | 1246070 | 23590 | 28030 | 40,9 | 403,2 | 33430 | 2129 | 3474 | 6,7 | 19,9 | 7153 | 81240 | 1 | 1 | 1 | 2 | 39 | 44 | 33 | 37 |
| HE 1000 x 494 | 494 | 1027950 | 19840 | 23410 | 40,4 | 344,5 | 26820 | 1736 | 2818 | 6,5 | 17,4 | 4395 | 64010 | 1 | 1 | 2 | 3 | 46 | 51 | 38 | 43 |
| HE 1000 x 438 | 438 | 909170 | 17720 | 20740 | 40,4 | 299,9 | 23350 | 1531 | 2462 | 6,4 | 16 | 3181 | 55290 | 1 | 1 | 3 | 4 | 51 | 57 | 42 | 48 |
| HE 1000 x 415 | 415 | 853120 | 16720 | 19570 | 40,1 | 288,5 | 21700 | 1428 | 2297 | 6,4 | 15,3 | 2703 | 51080 | 1 | 1 | 3 | 4 | 54 | 60 | 44 | 50 |
| HE 1000 x 393 | 393 | 807680 | 15890 | 18530 | 40,1 | 271,2 | 20490 | 1352 | 2167 | 6,4 | 14,7 | 2329 | 48080 | 1 | 1 | 4 | 4 | 57 | 63 | 47 | 53 |
| HE 1000 M | 349 | 722290 | 14330 | 16560 | 40,3 | 235,0 | 18450 | 1222 | 1939 | 6,4 | 13,6 | 1712 | 43010 | 1 | 1 | 4 | 4 | 64 | 70 | 52 | 59 |
| HE 1000 B | 314 | 644740 | 12890 | 14850 | 40,1 | 212,4 | 16270 | 1085 | 1716 | 6,3 | 12,6 | 1267 | 37630 | 1 | 1 | 4 | 4 | 70 | 78 | 57 | 65 |
| HE 1000 A | 272 | 553840 | 11180 | 12820 | 39,9 | 184,5 | 14000 | 933,6 | 1469 | 6,3 | 11,3 | 834,8 | 32070 | 1 | 2 | 4 | 4 | 81 | 89 | 66 | 74 |
| HE 1000 x 249 | 249 | 481070 | 9817 | 11340 | 38,9 | 180,7 | 11750 | 783,6 | 1244 | 6,0 | 10,3 | 581,9 | 26620 | 1 | 2 | 4 | 4 | 88 | 97 | 71 | 81 |
| HE 1000 AA | 222 | 406450 | 8380 | 9776 | 37,9 | 172,1 | 9500 | 633,3 | 1015 | 5,8 | 9,3 | 387,0 | 21270 | 1 | - | 4 | - | 98 | 108 | 79 | 90 |
| HE 900 x 466 | 466 | 814940 | 17370 | 20370 | 37,0 | 305,3 | 27550 | 1766 | 2831 | 6,8 | 17,3 | 4230 | 53400 | 1 | 1 | 1 | 2 | 45 | 51 | 37 | 42 |
| HE 900 x 391 | 391 | 674340 | 14620 | 16990 | 36,8 | 254,3 | 22320 | 1454 | 2312 | 6,6 | 15,2 | 2596 | 42550 | 1 | 1 | 2 | 4 | 54 | 60 | 43 | 49 |
| HE 900 M | 333 | 570430 | 12530 | 14440 | 36,6 | 214,4 | 18450 | 1221 | 1928 | 6,5 | 13,6 | 1682 | 34740 | 1 | 1 | 4 | 4 | 62 | 69 | 50 | 57 |
| HE 900 B | 291 | 494060 | 10970 | 12580 | 36,4 | 188,7 | 15810 | 1054 | 1658 | 6,5 | 12,3 | 1150 | 29460 | 1 | 1 | 4 | 4 | 70 | 78 | 57 | 65 |
| HE 900 A | 252 | 422070 | 9484 | 10810 | 36,2 | 163,3 | 13540 | 903,1 | 1414 | 6,4 | 11,1 | 749,0 | 24960 | 1 | 1 | 4 | 4 | 81 | 90 | 65 | 74 |
| HE 900 AA | 198 | 301140 | 6922 | 7998 | 34,5 | 147,2 | 9041 | 602,7 | 957,6 | 5,9 | 9,0 | 321,8 | 16250 | 1 | 1 | 4 | 4 | 101 | 113 | 81 | 93 |
| HE 800 x 444 | 444 | 634470 | 15070 | 17630 | 33,4 | 276,5 | 27800 | 1776 | 2827 | 7,0 | 17,3 | 4154 | 42840 | 1 | 1 | 1 | 1 | 44 | 50 | 35 | 41 |
| HE 800 x 373 | 373 | 523900 | 12680 | 14690 | 33,2 | 230,3 | 22520 | 1462 | 2311 | 6,8 | 15,2 | 2553 | 34070 | 1 | 1 | 2 | 2 | 52 | 59 | 41 | 48 |
| HE 800 M | 317 | 442590 | 10870 | 12480 | 33,0 | 194,2 | 18620 | 1229 | 1930 | 6,7 | 13,6 | 1657 | 27770 | 1 | 1 | 3 | 4 | 60 | 68 | 48 | 55 |
| HE 800 B | 262 | 359080 | 8977 | 10220 | 32,7 | 161,7 | 14900 | 993,5 | 1553 | 6,6 | 11,8 | 958,7 | 21840 | 1 | 1 | 4 | 4 | 72 | 81 | 57 | 66 |
| HE 800 A | 224 | 303440 | 7682 | 8699 | 32,5 | 138,8 | 12630 | 842,5 | 1312 | 6,6 | 10,6 | 608,6 | 18290 | 1 | 1 | 4 | 4 | 84 | 94 | 66 | 76 |
| HE 800 AA | 172 | 208880 | 5425 | 6224 | 30,9 | 123,8 | 8133 | 542,2 | 856,5 | 6,1 | 8,5 | 243,0 | 11450 | 1 | 1 | 4 | 4 | 108 | 122 | 84 | 98 |
| HE 700 x 418 | 418 | 472500 | 12700 | 14840 | 29,8 | 238,9 | 27760 | 1773 | 2796 | 7,2 | 16,9 | 3961 | 32840 | 1 | 1 | 1 | 1 | 44 | 50 | 34 | 40 |
| HE 700 x 352 | 352 | 389680 | 10700 | 12380 | 29,4 | 201,5 | 22500 | 1461 | 2292 | 7,0 | 14,8 | 2453 | 26040 | 1 | 1 | 1 | 1 | 51 | 58 | 39 | 46 |
| HE 700 M | 301 | 329270 | 9197 | 10530 | 29,3 | 169,8 | 18790 | 1236 | 1928 | 7,0 | 13,2 | 1594 | 21390 | 1 | 1 | 2 | 3 | 59 | 67 | 45 | 53 |
| HE 700 B | 241 | 256880 | 7339 | 8327 | 28,9 | 137,0 | 14440 | 962,7 | 1495 | 6,8 | 11,2 | 838,8 | 16060 | 1 | 1 | 4 | 4 | 72 | 82 | 55 | 65 |
| HE 700 A | 204 | 215300 | 6240 | 7031 | 28,7 | 116,9 | 12170 | 811,9 | 1256 | 6,8 | 10,0 | 521,5 | 13350 | 1 | 1 | 4 | 4 | 85 | 96 | 64 | 76 |
| HE 700 AA | 150 | 142720 | 4260 | 4840 | 27,3 | 100,3 | 7673 | 511,5 | 799,7 | 6,3 | 7,8 | 186,3 | 8155 | 1 | 2 | 4 | 4 | 114 | 129 | 86 | 102 |

Wide flange beams (continued)

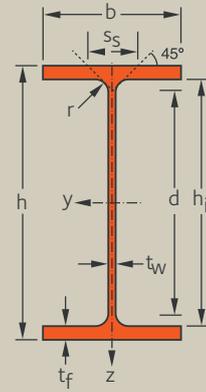
Dimensions: EN 10365:2017
Tolerances: EN 10034:1993
Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles de alas anchas (continúa)

Dimensiones: EN 10365:2017
Tolerancias: EN 10034:1993
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki szerokostopowe (ciąg dalszy)

Wymiary: EN 10365:2017
Tolerancje: EN 10034:1993
Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | G | Dimensions Dimensiones Wymiary | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | |
|---|-----|--------------------------------------|-------|----------------|----------------|------|----------------|---------------------------------------|-------------------|-------------------|---|-------|----|-------------|-------------|-------------|---|------|-------------|----------|------|----|---|
| | | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _C | S355 | | | S460 | | | S500 | | | | | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO/MLO/ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO/ML10 | JO/M | ML | |
| HE 650 x 407 | 407 | 696,0 | 314,0 | 29,5 | 54,0 | 27 | 588,0 | 534,0 | 518,8 | 2,543 | 6,244 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 650 x 343 | 343 | 680,0 | 309,0 | 25,0 | 46,0 | 27 | 588,0 | 534,0 | 437,5 | 2,500 | 7,279 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 650 M | 293 | 668,0 | 305,0 | 21,0 | 40,0 | 27 | 588,0 | 534,0 | 373,7 | 2,468 | 8,412 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 650 B | 225 | 650,0 | 300,0 | 16,0 | 31,0 | 27 | 588,0 | 534,0 | 286,3 | 2,422 | 10,78 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 650 A | 190 | 640,0 | 300,0 | 13,5 | 26,0 | 27 | 588,0 | 534,0 | 241,6 | 2,407 | 12,69 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 650 AA | 40 | 138 | 620,0 | 300,0 | 12,5 | 16,0 | 27 | 588,0 | 534,0 | 175,8 | 2,369 | 17,17 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - |
| HE 600 x 399 | 399 | 648,0 | 315,0 | 30,0 | 54,0 | 27 | 540,0 | 486,0 | 508,5 | 2,450 | 6,138 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 600 x 337 | 337 | 632,0 | 310,0 | 25,5 | 46,0 | 27 | 540,0 | 486,0 | 429,2 | 2,407 | 7,145 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| HE 600 M | 285 | 620,0 | 305,0 | 21,0 | 40,0 | 27 | 540,0 | 486,0 | 363,7 | 2,372 | 8,309 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 600 B | 212 | 600,0 | 300,0 | 15,5 | 30,0 | 27 | 540,0 | 486,0 | 270,0 | 2,323 | 10,96 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 600 A | 178 | 590,0 | 300,0 | 13,0 | 25,0 | 27 | 540,0 | 486,0 | 226,5 | 2,308 | 12,98 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 600 AA | 40 | 129 | 571,0 | 300,0 | 12,0 | 15,5 | 27 | 540,0 | 486,0 | 164,1 | 2,272 | 17,64 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - |
| HE 550 M | 278 | 572,0 | 306,0 | 21,0 | 40,0 | 27 | 492,0 | 438,0 | 354,4 | 2,280 | 8,196 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 550 B | 199 | 550,0 | 300,0 | 15,0 | 29,0 | 27 | 492,0 | 438,0 | 254,1 | 2,224 | 11,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 550 A | 166 | 540,0 | 300,0 | 12,5 | 24,0 | 27 | 492,0 | 438,0 | 211,8 | 2,209 | 13,29 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 550 AA | 40 | 120 | 522,0 | 300,0 | 11,5 | 15,0 | 27 | 492,0 | 438,0 | 152,8 | 2,175 | 18,13 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - |
| HE 500 M | 270 | 524,0 | 306,0 | 21,0 | 40,0 | 27 | 444,0 | 390,0 | 344,3 | 2,184 | 8,081 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 500 B | 187 | 500,0 | 300,0 | 14,5 | 28,0 | 27 | 444,0 | 390,0 | 238,6 | 2,125 | 11,34 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 500 A | 155 | 490,0 | 300,0 | 12,0 | 23,0 | 27 | 444,0 | 390,0 | 197,5 | 2,110 | 13,61 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 500 AA | 40 | 107 | 472,0 | 300,0 | 10,5 | 14,0 | 27 | 444,0 | 390,0 | 136,9 | 2,077 | 19,33 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - |
| HE 450 M | 263 | 478,0 | 307,0 | 21,0 | 40,0 | 27 | 398,0 | 344,0 | 335,4 | 2,096 | 7,960 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 450 B | 171 | 450,0 | 300,0 | 14,0 | 26,0 | 27 | 398,0 | 344,0 | 218,0 | 2,026 | 11,84 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 450 A | 140 | 440,0 | 300,0 | 11,5 | 21,0 | 27 | 398,0 | 344,0 | 178,0 | 2,011 | 14,39 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 450 AA | 40 | 99,7 | 425,0 | 300,0 | 10,0 | 13,5 | 27 | 398,0 | 344,0 | 127,1 | 1,984 | 19,89 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - |
| HE 400 M | 256 | 432,0 | 307,0 | 21,0 | 40,0 | 27 | 352,0 | 298,0 | 325,8 | 2,004 | 7,836 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 400 B | 155 | 400,0 | 300,0 | 13,5 | 24,0 | 27 | 352,0 | 298,0 | 197,8 | 1,927 | 12,41 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 400 A | 125 | 390,0 | 300,0 | 11,0 | 19,0 | 27 | 352,0 | 298,0 | 159,0 | 1,912 | 15,32 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 400 AA | 40 | 92,4 | 378,0 | 300,0 | 9,5 | 13,0 | 27 | 352,0 | 298,0 | 117,7 | 1,891 | 20,47 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - |
| HE 360 M | 250 | 395,0 | 308,0 | 21,0 | 40,0 | 27 | 315,0 | 261,0 | 318,8 | 1,934 | 7,728 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 360 B | 142 | 360,0 | 300,0 | 12,5 | 22,5 | 27 | 315,0 | 261,0 | 180,6 | 1,849 | 13,04 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 360 A | 112 | 350,0 | 300,0 | 10,0 | 17,5 | 27 | 315,0 | 261,0 | 142,8 | 1,834 | 16,37 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 360 AA | 40 | 83,7 | 339,0 | 300,0 | 9,0 | 12,0 | 27 | 315,0 | 261,0 | 106,6 | 1,814 | 21,68 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.
Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo
Plazo mínimo y condiciones de entrega previo acuerdo

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
Minimalny tonaż i warunki dostawy po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | |
|---|---|-----------------|------------------|------------------|-----------------|-----------------|---|------------------|------------------|----------------|-----------------|-----------------|------------------------|------------------------------------|---------------------|------|-----------------------|---|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | G | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | |
| HE 650 x 407 | 407 | 405420 | 11650 | 13610 | 27,9 | 224,8 | 28010 | 1784 | 2803 | 7,3 | 16,9 | 3930 | 28710 | 1 | 1 | 1 | 1 | 43 | 49 | 33 | 39 |
| HE 650 x 343 | 343 | 333710 | 9815 | 11350 | 27,6 | 189,5 | 22710 | 1470 | 2299 | 7,2 | 14,8 | 2435 | 22730 | 1 | 1 | 1 | 1 | 50 | 57 | 38 | 45 |
| HE 650 M | 293 | 281660 | 8433 | 9656 | 27,4 | 159,7 | 18970 | 1244 | 1935 | 7,1 | 13,2 | 1584 | 18640 | 1 | 1 | 1 | 2 | 58 | 66 | 44 | 52 |
| HE 650 B | 225 | 210610 | 6480 | 7319 | 27,1 | 122,0 | 13980 | 932,2 | 1441 | 6,9 | 10,9 | 749,2 | 13360 | 1 | 1 | 3 | 4 | 74 | 85 | 56 | 66 |
| HE 650 A | 190 | 175170 | 5474 | 6136 | 26,9 | 103,1 | 11720 | 781,5 | 1204 | 6,9 | 9,7 | 457,6 | 11020 | 1 | 1 | 4 | 4 | 87 | 100 | 65 | 78 |
| HE 650 AA | 138 | 113940 | 3675 | 4159 | 25,4 | 90,39 | 7220 | 481,3 | 750,6 | 6,4 | 7,6 | 158,4 | 6566 | 1 | 3 | 4 | 4 | 118 | 135 | 88 | 105 |
| HE 600 x 399 | 399 | 344640 | 10630 | 12450 | 26 | 213,6 | 28280 | 1795 | 2813 | 7,4 | 16,9 | 3933 | 24810 | 1 | 1 | 1 | 1 | 42 | 48 | 32 | 38 |
| HE 600 x 337 | 337 | 283160 | 8960 | 10380 | 25,6 | 180,5 | 22930 | 1479 | 2309 | 7,3 | 14,9 | 2440 | 19600 | 1 | 1 | 1 | 1 | 49 | 56 | 37 | 44 |
| HE 600 M | 285 | 237440 | 7659 | 8772 | 25,5 | 149,6 | 18970 | 1244 | 1930 | 7,2 | 13,2 | 1569 | 15900 | 1 | 1 | 1 | 1 | 57 | 65 | 42 | 51 |
| HE 600 B | 212 | 171040 | 5701 | 6425 | 25,1 | 110,8 | 13530 | 902,0 | 1391 | 7,0 | 10,7 | 677,1 | 10960 | 1 | 1 | 3 | 4 | 75 | 86 | 56 | 67 |
| HE 600 A | 178 | 141200 | 4786 | 5350 | 24,9 | 93,20 | 11270 | 751,4 | 1155 | 7,0 | 9,4 | 406,8 | 8978 | 1 | 1 | 4 | 4 | 89 | 102 | 65 | 79 |
| HE 600 AA | 129 | 91870 | 3217 | 3623 | 23,6 | 81,28 | 6993 | 466,2 | 724,4 | 6,5 | 7,4 | 141,7 | 5380 | 2 | 3 | 4 | 4 | 120 | 138 | 88 | 106 |
| HE 550 M | 278 | 197980 | 6922 | 7932 | 23,6 | 139,5 | 19150 | 1252 | 1937 | 7,3 | 13,2 | 1558 | 13510 | 1 | 1 | 1 | 1 | 56 | 64 | 41 | 50 |
| HE 550 B | 199 | 136690 | 4970 | 5590 | 23,1 | 100,0 | 13070 | 871,7 | 1341 | 7,1 | 10,4 | 610,1 | 8855 | 1 | 1 | 2 | 3 | 76 | 88 | 55 | 67 |
| HE 550 A | 166 | 111930 | 4145 | 4621 | 22,9 | 83,71 | 10810 | 721,2 | 1106 | 7,1 | 9,2 | 360,3 | 7188 | 1 | 1 | 4 | 4 | 90 | 104 | 65 | 79 |
| HE 550 AA | 120 | 72870 | 2792 | 3127 | 21,8 | 72,66 | 6766 | 451,1 | 698,6 | 6,6 | 7,3 | 126,6 | 4337 | 2 | 3 | 4 | 4 | 123 | 142 | 88 | 108 |
| HE 500 M | 270 | 161920 | 6180 | 7094 | 21,6 | 129,4 | 19150 | 1251 | 1932 | 7,4 | 13,2 | 1544 | 11180 | 1 | 1 | 1 | 1 | 55 | 63 | 39 | 48 |
| HE 500 B | 187 | 107170 | 4287 | 4814 | 21,1 | 89,81 | 12620 | 841,5 | 1291 | 7,2 | 10,2 | 548,1 | 7017 | 1 | 1 | 2 | 2 | 76 | 89 | 54 | 67 |
| HE 500 A | 155 | 86970 | 3549 | 3948 | 20,9 | 74,71 | 10360 | 691,1 | 1058 | 7,2 | 8,9 | 317,8 | 5643 | 1 | 1 | 3 | 4 | 92 | 107 | 65 | 80 |
| HE 500 AA | 107 | 54640 | 2315 | 2576 | 19,9 | 61,90 | 6313 | 420,9 | 649,2 | 6,7 | 7,0 | 102,6 | 3303 | 3 | 3 | 4 | 4 | 130 | 152 | 91 | 113 |
| HE 450 M | 263 | 131480 | 5501 | 6331 | 19,7 | 119,8 | 19330 | 1259 | 1939 | 7,5 | 13,2 | 1534 | 9251 | 1 | 1 | 1 | 1 | 53 | 62 | 38 | 47 |
| HE 450 B | 171 | 79880 | 3550 | 3982 | 19,1 | 79,65 | 11720 | 781,4 | 1197 | 7,3 | 9,7 | 447,9 | 5258 | 1 | 1 | 1 | 2 | 79 | 93 | 55 | 69 |
| HE 450 A | 140 | 63720 | 2896 | 3215 | 18,9 | 65,78 | 9465 | 631 | 965,5 | 7,2 | 8,5 | 250,1 | 4147 | 1 | 1 | 2 | 3 | 96 | 113 | 66 | 83 |
| HE 450 AA | 99,7 | 41880 | 1971 | 2183 | 18,1 | 54,69 | 6087 | 405,8 | 624,3 | 6,9 | 6,8 | 91,39 | 2571 | 3 | 3 | 4 | 4 | 133 | 156 | 91 | 114 |
| HE 400 M | 256 | 104110 | 4820 | 5570 | 17,8 | 110,1 | 19330 | 1259 | 1934 | 7,7 | 13,2 | 1520 | 7410 | 1 | 1 | 1 | 1 | 52 | 62 | 36 | 45 |
| HE 400 B | 155 | 57680 | 2884 | 3231 | 17 | 69,97 | 10810 | 721,2 | 1104 | 7,3 | 9,3 | 361,0 | 3817 | 1 | 1 | 1 | 1 | 82 | 97 | 56 | 71 |
| HE 400 A | 125 | 45060 | 2311 | 2561 | 16,8 | 57,32 | 8563 | 570,9 | 872,8 | 7,3 | 8,0 | 193,1 | 2942 | 1 | 1 | 2 | 2 | 101 | 120 | 68 | 87 |
| HE 400 AA | 92,4 | 31250 | 1653 | 1824 | 16,2 | 47,95 | 5861 | 390,7 | 599,6 | 7,0 | 6,7 | 81,31 | 1948 | 3 | 3 | 3 | 4 | 135 | 161 | 90 | 115 |
| HE 360 M | 250 | 84860 | 4297 | 4989 | 16,3 | 102,4 | 19520 | 1267 | 1942 | 7,8 | 13,2 | 1512 | 6137 | 1 | 1 | 1 | 1 | 51 | 61 | 34 | 44 |
| HE 360 B | 142 | 43190 | 2399 | 2682 | 15,4 | 60,59 | 10140 | 676,0 | 1032 | 7,4 | 8,9 | 298,3 | 2883 | 1 | 1 | 1 | 1 | 86 | 102 | 56 | 73 |
| HE 360 A | 112 | 33080 | 1890 | 2088 | 15,2 | 48,95 | 7886 | 525,7 | 802,2 | 7,4 | 7,6 | 153,3 | 2176 | 1 | 2 | 1 | 2 | 107 | 128 | 70 | 91 |
| HE 360 AA | 83,7 | 23030 | 1359 | 1495 | 14,7 | 42,16 | 5410 | 360,6 | 552,9 | 7,1 | 6,4 | 67,13 | 1443 | 3 | 3 | 3 | 3 | 142 | 170 | 92 | 120 |

Wide flange beams (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles de alas anchas (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

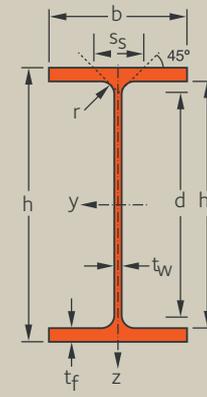
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki szerokostopowe (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | G kg/m | Dimensions Dimensiones Wymiary | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | |
|---|----------------|--------------------------------------|---------|----------------------|----------------------|---------|----------------------|---------------------------------------|----------------------|-------------------------------------|---|-------------|----|----|-------------|-------------|-------------|------|----|-------------|----------|------|----|
| | | h mm | b mm | t _w mm | t _f mm | r mm | h ₁ mm | d mm | A cm ² | A _L m ² /m | A _C m ² /t | S355 | | | S460 | | | S500 | | | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO/MLO/ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO/ML10 | JO/M | ML |
| HE 340 M | 248 | 377,0 | 309,0 | 21,0 | 40,0 | 27 | 297,0 | 243,0 | 315,8 | 1,902 | 7,672 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 340 B | 134 | 340,0 | 300,0 | 12,0 | 21,5 | 27 | 297,0 | 243,0 | 170,9 | 1,810 | 13,49 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 340 A | 105 | 330,0 | 300,0 | 9,5 | 16,5 | 27 | 297,0 | 243,0 | 133,5 | 1,795 | 17,13 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 340 AA | 40 78,9 | 320,0 | 300,0 | 8,5 | 11,5 | 27 | 297,0 | 243,0 | 100,5 | 1,777 | 22,52 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| HE 320 M | 245 | 359,0 | 309,0 | 21,0 | 40,0 | 27 | 279,0 | 225,0 | 312,0 | 1,866 | 7,618 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HE 320 C | 40 186 | 340,0 | 305,0 | 16,0 | 30,5 | 27 | 279,0 | 225,0 | 236,9 | 1,822 | 9,795 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 320 B | 127 | 320,0 | 300,0 | 11,5 | 20,5 | 27 | 279,0 | 225,0 | 161,3 | 1,771 | 13,98 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 320 A | 97,6 | 310,0 | 300,0 | 9,0 | 15,5 | 27 | 279,0 | 225,0 | 124,4 | 1,756 | 17,99 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 320 AA | 40 74,2 | 301,0 | 300,0 | 8,0 | 11,0 | 27 | 279,0 | 225,0 | 94,6 | 1,740 | 23,44 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| HE 300 M | 238 | 340,0 | 310,0 | 21,0 | 39,0 | 27 | 262,0 | 208,0 | 303,1 | 1,832 | 7,70 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 300 C | 40 177 | 320,0 | 305,0 | 16,0 | 29,0 | 27 | 262,0 | 208,0 | 225,1 | 1,782 | 10,09 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 300 B | 117 | 300,0 | 300,0 | 11,0 | 19,0 | 27 | 262,0 | 208,0 | 149,1 | 1,732 | 14,80 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 300 A | 88,3 | 290,0 | 300,0 | 8,5 | 14,0 | 27 | 262,0 | 208,0 | 112,5 | 1,717 | 19,44 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 300 AA | 40 69,8 | 283,0 | 300,0 | 7,5 | 10,5 | 27 | 262,0 | 208,0 | 88,9 | 1,705 | 24,43 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| HE 280 M | 189 | 310,0 | 288,0 | 18,5 | 33,0 | 24 | 244,0 | 196,0 | 240,2 | 1,694 | 8,985 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 280 C | 40 145 | 295,0 | 284,0 | 14,5 | 25,5 | 24 | 244,0 | 196,0 | 185,2 | 1,656 | 11,39 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 280 B | 103 | 280,0 | 280,0 | 10,5 | 18,0 | 24 | 244,0 | 196,0 | 131,4 | 1,618 | 15,69 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 280 A | 76,4 | 270,0 | 280,0 | 8,0 | 13,0 | 24 | 244,0 | 196,0 | 97,3 | 1,603 | 20,99 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 280 AA | 40 61,2 | 264,0 | 280,0 | 7,0 | 10,0 | 24 | 244,0 | 196,0 | 78,0 | 1,593 | 26,01 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |
| HE 260 M | 172 | 290,0 | 268,0 | 18,0 | 32,5 | 24 | 225,0 | 177,0 | 219,6 | 1,575 | 9,135 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 260 C | 40 132 | 275,0 | 264,0 | 14,0 | 25,0 | 24 | 225,0 | 177,0 | 168,4 | 1,537 | 11,62 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 260 B | 93,0 | 260,0 | 260,0 | 10,0 | 17,5 | 24 | 225,0 | 177,0 | 118,4 | 1,499 | 16,12 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 260 A | 68,2 | 250,0 | 260,0 | 7,5 | 12,5 | 24 | 225,0 | 177,0 | 86,8 | 1,484 | 21,77 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HE 260 AA | 40 54,1 | 244,0 | 260,0 | 6,5 | 9,5 | 24 | 225,0 | 177,0 | 69,0 | 1,474 | 27,23 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |
| HE 240 M | 157 | 270,0 | 248,0 | 18,0 | 32,0 | 21 | 206,0 | 164,0 | 199,6 | 1,460 | 9,319 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| HE 240 C | 40 119 | 255,0 | 244,0 | 14,0 | 24,5 | 21 | 206,0 | 164,0 | 152,2 | 1,422 | 11,90 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - |
| HE 240 B | 83,2 | 240,0 | 240,0 | 10,0 | 17,0 | 21 | 206,0 | 164,0 | 106,0 | 1,384 | 16,63 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | - | ✓ | - | - | - |
| HE 240 A | 60,3 | 230,0 | 240,0 | 7,5 | 12,0 | 21 | 206,0 | 164,0 | 76,8 | 1,369 | 22,70 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |
| HE 240 AA | 40 47,4 | 224,0 | 240,0 | 6,5 | 9,0 | 21 | 206,0 | 164,0 | 60,4 | 1,359 | 28,67 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |
| HE 220 M | 117 | 240,0 | 226,0 | 15,5 | 26,0 | 18 | 188,0 | 152,0 | 149,4 | 1,322 | 11,27 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |
| HE 220 C | 94,1 | 230,0 | 223,0 | 12,5 | 21,0 | 18 | 188,0 | 152,0 | 119,9 | 1,296 | 13,76 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |
| HE 220 B | 71,5 | 220,0 | 220,0 | 9,5 | 16,0 | 18 | 188,0 | 152,0 | 91,0 | 1,270 | 17,77 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | | |
|---|---|--------------------------|------------------------------|------------------------------|-------------|-----------------------------|---|------------------------------|------------------------------|-------------|-------------|--------------------------|------------------------------------|-----------|---------------------|-----------|---|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | G kg/m | I_y cm ⁴ | W_{ely} cm ³ | W_{ply} cm ³ | i_y cm | A_{vz} cm ² | I_z cm ⁴ | W_{elz} cm ³ | W_{plz} cm ³ | i_z cm | S_s cm | I_t cm ⁴ | I_w cm ⁶ | S_{355} | S_{460} | S_{355} | S_{460} | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| HE 340 M | 248 | 76370 | 4051 | 4717 | 15,5 | 98,62 | 19710 | 1275 | 1952 | 7,8 | 13,2 | 1511 | 5584 | 1 | 1 | 1 | 1 | 50 | 60 | 34 | 43 |
| HE 340 B | 134 | 36650 | 2156 | 2408 | 14,6 | 56,08 | 9689 | 645,9 | 985,7 | 7,5 | 8,6 | 262,8 | 2453 | 1 | 1 | 1 | 1 | 88 | 106 | 57 | 75 |
| HE 340 A | 105 | 27690 | 1678 | 1850 | 14,4 | 44,95 | 7435 | 495,7 | 755,9 | 7,4 | 7,4 | 131,4 | 1824 | 1 | 3 | 1 | 3 | 112 | 134 | 72 | 94 |
| HE 340 AA | 78,9 | 19550 | 1222 | 1340 | 13,9 | 38,69 | 5184 | 345,6 | 529,2 | 7,1 | 6,3 | 60,01 | 1231 | 3 | 4 | 3 | 4 | 147 | 177 | 94 | 123 |
| HE 320 M | 245 | 68130 | 3795 | 4435 | 14,7 | 94,84 | 19700 | 1275 | 1950 | 7,9 | 13,2 | 1506 | 5003 | 1 | 1 | 1 | 1 | 50 | 60 | 33 | 43 |
| HE 320 C | 186 | 48710 | 2865 | 3274 | 14,3 | 72,24 | 14440 | 947,2 | 1445 | 7,8 | 10,8 | 688,0 | 3453 | 1 | 1 | 1 | 1 | 64 | 77 | 42 | 54 |
| HE 320 B | 127 | 30820 | 1926 | 2149 | 13,8 | 51,77 | 9238 | 615,9 | 939 | 7,5 | 8,4 | 230,4 | 2068 | 1 | 1 | 1 | 1 | 91 | 110 | 58 | 77 |
| HE 320 A | 97,6 | 22920 | 1479 | 1628 | 13,5 | 41,13 | 6985 | 465,6 | 709,7 | 7,4 | 7,1 | 111,8 | 1512 | 2 | 3 | 2 | 3 | 117 | 141 | 74 | 98 |
| HE 320 AA | 74,2 | 16440 | 1092 | 1196 | 13,1 | 35,39 | 4959 | 330,6 | 505,7 | 7,2 | 6,1 | 53,58 | 1040 | 3 | 4 | 3 | 4 | 152 | 184 | 95 | 127 |
| HE 300 M | 238 | 59200 | 3482 | 4077 | 13,9 | 90,52 | 19400 | 1251 | 1913 | 8,0 | 13 | 1410 | 4386 | 1 | 1 | 1 | 1 | 50 | 60 | 33 | 43 |
| HE 300 C | 177 | 40950 | 2559 | 2926 | 13,4 | 68,47 | 13730 | 900,7 | 1374 | 7,8 | 10,5 | 604,0 | 2903 | 1 | 1 | 1 | 1 | 66 | 79 | 42 | 56 |
| HE 300 B | 117 | 25160 | 1677 | 1868 | 12,9 | 47,42 | 8562 | 570,8 | 870,1 | 7,5 | 8,0 | 189,1 | 1687 | 1 | 1 | 1 | 1 | 96 | 116 | 60 | 80 |
| HE 300 A | 88,3 | 18260 | 1259 | 1383 | 12,7 | 37,27 | 6309 | 420,6 | 641,1 | 7,4 | 6,8 | 87,76 | 1199 | 3 | 3 | 3 | 3 | 126 | 153 | 78 | 105 |
| HE 300 AA | 69,8 | 13800 | 975,5 | 1065 | 12,4 | 32,36 | 4733 | 315,5 | 482,3 | 7,2 | 6,0 | 47,80 | 877,1 | 3 | 4 | 3 | 4 | 158 | 192 | 97 | 131 |
| HE 280 M | 189 | 39540 | 2551 | 2965 | 12,8 | 72,02 | 13160 | 914,0 | 1396 | 7,4 | 11,2 | 807,2 | 2520 | 1 | 1 | 1 | 1 | 59 | 71 | 38 | 50 |
| HE 280 C | 145 | 28800 | 1953 | 2225 | 12,4 | 56,26 | 9750 | 686,6 | 1047 | 7,2 | 9,3 | 384,8 | 1767 | 1 | 1 | 1 | 1 | 74 | 89 | 47 | 63 |
| HE 280 B | 103 | 19270 | 1376 | 1534 | 12,1 | 41,09 | 6594 | 471,0 | 717,5 | 7,0 | 7,4 | 146,0 | 1130 | 1 | 1 | 1 | 1 | 102 | 123 | 64 | 85 |
| HE 280 A | 76,4 | 13670 | 1012 | 1112 | 11,8 | 31,74 | 4762 | 340,1 | 518,1 | 6,9 | 6,2 | 63,45 | 785,3 | 3 | 3 | 3 | 3 | 136 | 165 | 84 | 113 |
| HE 280 AA | 61,2 | 10550 | 799,8 | 873,0 | 11,6 | 27,52 | 3664 | 261,7 | 399,3 | 6,8 | 5,5 | 35,49 | 590,1 | 3 | 4 | 3 | 4 | 168 | 204 | 104 | 139 |
| HE 260 M | 172 | 31300 | 2159 | 2523 | 11,9 | 66,89 | 10440 | 779,7 | 1192 | 6,8 | 11,1 | 720,1 | 1728 | 1 | 1 | 1 | 1 | 59 | 72 | 39 | 51 |
| HE 260 C | 132 | 22590 | 1642 | 1880 | 11,5 | 51,94 | 7680 | 581,8 | 888,3 | 6,7 | 9,2 | 339,5 | 1197 | 1 | 1 | 1 | 1 | 76 | 91 | 48 | 64 |
| HE 260 B | 93,0 | 14910 | 1147 | 1282 | 11,2 | 37,59 | 5134 | 394,9 | 602,2 | 6,5 | 7,3 | 126,6 | 753,6 | 1 | 1 | 1 | 1 | 105 | 127 | 66 | 88 |
| HE 260 A | 68,2 | 10450 | 836,3 | 919,7 | 10,9 | 28,75 | 3667 | 282,1 | 430,1 | 6,4 | 6,0 | 54,19 | 516,3 | 3 | 3 | 3 | 3 | 141 | 171 | 88 | 117 |
| HE 260 AA | 54,1 | 7980 | 654,1 | 714,4 | 10,7 | 24,74 | 2788 | 214,4 | 327,7 | 6,3 | 5,3 | 30,09 | 382,5 | 3 | 4 | 3 | 4 | 176 | 214 | 108 | 146 |
| HE 240 M | 157 | 24280 | 1799 | 2116 | 11,0 | 60,06 | 8152 | 657,4 | 1005 | 6,3 | 10,6 | 626,0 | 1151 | 1 | 1 | 1 | 1 | 61 | 73 | 39 | 52 |
| HE 240 C | 119 | 17320 | 1358 | 1563 | 10,6 | 46,34 | 5942 | 487,0 | 743,8 | 6,2 | 8,7 | 289,4 | 787,8 | 1 | - | 1 | - | 77 | 93 | 50 | 66 |
| HE 240 B | 83,2 | 11250 | 938,2 | 1053 | 10,3 | 33,22 | 3922 | 326,8 | 498,4 | 6,0 | 6,8 | 103,8 | 486,9 | 1 | 1 | 1 | 1 | 108 | 131 | 68 | 91 |
| HE 240 A | 60,3 | 7763 | 675 | 744,6 | 10,0 | 25,17 | 2768 | 230,7 | 351,6 | 6,0 | 5,6 | 42,14 | 328,4 | 2 | 3 | 2 | 3 | 147 | 178 | 91 | 122 |
| HE 240 AA | 47,4 | 5835 | 520,9 | 570,5 | 9,8 | 21,54 | 2077 | 173,0 | 264,3 | 5,8 | 4,9 | 22,14 | 239,6 | 3 | 4 | 3 | 4 | 185 | 225 | 114 | 154 |
| HE 220 M | 117 | 14600 | 1217 | 1419 | 9,8 | 45,31 | 5012 | 443,5 | 678,5 | 5,7 | 8,8 | 313,0 | 572,6 | 1 | 1 | 1 | 1 | 73 | 88 | 47 | 62 |
| HE 220 C | 94,1 | 11170 | 972,1 | 1114 | 9,6 | 36,46 | 3887 | 348,6 | 532,3 | 5,6 | 7,5 | 167,8 | 423,8 | 1 | 1 | 1 | 1 | 89 | 108 | 57 | 76 |
| HE 220 B | 71,5 | 8090 | 735,5 | 827,0 | 9,4 | 27,92 | 2843 | 258,4 | 393,8 | 5,5 | 6,2 | 77,02 | 295,4 | 1 | 1 | 1 | 1 | 115 | 140 | 72 | 97 |

Wide flange beams (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles de alas anchas (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

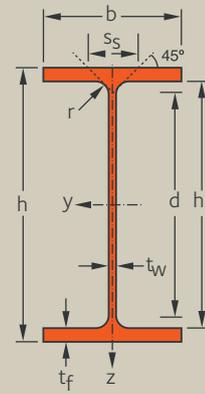
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki szerokostopowe (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | | |
|---|--|---------|---------|-------------|-------------|---------|-------------|---------------------------------------|----------------------|----------------------------|---|-------------|---|----|-------------|-----------------|-------------|------|----|-------------|------------|--------|----|---|
| | G kg/m | h mm | b mm | t_w mm | t_f mm | r mm | h_1 mm | d mm | A cm ² | A_L m ² /m | A_C m ² /t | S355 | | | S460 | | | S500 | | | | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W | MLO / ML10 | JO / M | ML | |
| HE 220 A | 50,5 | 210,0 | 220,0 | 7,0 | 11,0 | 18 | 188,0 | 152,0 | 64,3 | 1,255 | 24,85 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 220 AA | 40 | 40,4 | 205,0 | 220,0 | 6,0 | 8,5 | 18 | 188,0 | 152,0 | 51,5 | 1,247 | 30,87 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| HE 200 M | 103 | 220,0 | 206,0 | 15,0 | 25,0 | 18 | 170,0 | 134,0 | 131,3 | 1,203 | 11,67 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 200 C | 81,9 | 210,0 | 203,0 | 12,0 | 20,0 | 18 | 170,0 | 134,0 | 104,4 | 1,177 | 14,36 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 200 B | 61,3 | 200,0 | 200,0 | 9,0 | 15,0 | 18 | 170,0 | 134,0 | 78,1 | 1,151 | 18,78 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 200 A | 42,3 | 190,0 | 200,0 | 6,5 | 10,0 | 18 | 170,0 | 134,0 | 53,8 | 1,136 | 26,88 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 200 AA | 40 | 34,6 | 186,0 | 200,0 | 5,5 | 8,0 | 18 | 170,0 | 134,0 | 44,1 | 1,130 | 32,62 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| HE 180 M | 88,9 | 200,0 | 186,0 | 14,5 | 24,0 | 15 | 152,0 | 122,0 | 113,3 | 1,089 | 12,25 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 180 C | 69,8 | 190,0 | 183,0 | 11,5 | 19,0 | 15 | 152,0 | 122,0 | 89,0 | 1,063 | 15,22 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 180 B | 51,2 | 180,0 | 180,0 | 8,5 | 14,0 | 15 | 152,0 | 122,0 | 65,3 | 1,037 | 20,25 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 180 A | 35,5 | 171,0 | 180,0 | 6,0 | 9,5 | 15 | 152,0 | 122,0 | 45,3 | 1,024 | 28,83 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 180 AA | 40 | 28,7 | 167,0 | 180,0 | 5,0 | 7,5 | 15 | 152,0 | 122,0 | 36,5 | 1,018 | 35,50 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| HE 160 M | 76,2 | 180,0 | 166,0 | 14,0 | 23,0 | 15 | 134,0 | 104,0 | 97,1 | 0,970 | 12,73 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 160 C | 59,2 | 170,0 | 163,0 | 11,0 | 18,0 | 15 | 134,0 | 104,0 | 75,4 | 0,944 | 15,96 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 160 B | 42,6 | 160,0 | 160,0 | 8,0 | 13,0 | 15 | 134,0 | 104,0 | 54,3 | 0,918 | 21,56 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 160 A | 30,4 | 152,0 | 160,0 | 6,0 | 9,0 | 15 | 134,0 | 104,0 | 38,8 | 0,906 | 29,77 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 160 AA | 40 | 23,8 | 148,0 | 160,0 | 4,5 | 7,0 | 15 | 134,0 | 104,0 | 30,4 | 0,901 | 37,80 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| HE 140 M | 63,2 | 160,0 | 146,0 | 13,0 | 22,0 | 12 | 116,0 | 92,0 | 80,6 | 0,857 | 13,55 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 140 C | 48,2 | 150,0 | 143,0 | 10,0 | 17,0 | 12 | 116,0 | 92,0 | 61,5 | 0,831 | 17,23 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 140 B | 33,7 | 140,0 | 140,0 | 7,0 | 12,0 | 12 | 116,0 | 92,0 | 43,0 | 0,805 | 23,87 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 140 A | 24,7 | 133,0 | 140,0 | 5,5 | 8,5 | 12 | 116,0 | 92,0 | 31,4 | 0,794 | 32,20 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 140 AA | 18,1 | 128,0 | 140,0 | 4,3 | 6,0 | 12 | 116,0 | 92,0 | 23,0 | 0,787 | 43,54 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 120 M | 52,1 | 140,0 | 126,0 | 12,5 | 21,0 | 12 | 98,0 | 74,0 | 66,4 | 0,738 | 14,16 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 120 C | 39,2 | 130,0 | 123,0 | 9,5 | 16,0 | 12 | 98,0 | 74,0 | 49,9 | 0,712 | 18,17 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 120 B | 26,7 | 120,0 | 120,0 | 6,5 | 11,0 | 12 | 98,0 | 74,0 | 34,0 | 0,686 | 25,70 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 120 A | 19,9 | 114,0 | 120,0 | 5,0 | 8,0 | 12 | 98,0 | 74,0 | 25,3 | 0,677 | 34,04 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 120 AA | 14,6 | 109,0 | 120,0 | 4,2 | 5,5 | 12 | 98,0 | 74,0 | 18,6 | 0,669 | 45,94 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | |
| HE 100 M | 41,8 | 120,0 | 106,0 | 12,0 | 20,0 | 12 | 80,0 | 56,0 | 53,2 | 0,619 | 14,81 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 100 C | 30,9 | 110,0 | 103,0 | 9,0 | 15,0 | 12 | 80,0 | 56,0 | 39,3 | 0,593 | 19,20 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| HE 100 B | 20,4 | 100,0 | 100,0 | 6,0 | 10,0 | 12 | 80,0 | 56,0 | 26,0 | 0,567 | 27,74 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 100 A | 16,7 | 96,0 | 100,0 | 5,0 | 8,0 | 12 | 80,0 | 56,0 | 21,2 | 0,561 | 33,65 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | |
| HE 100 AA | 12,2 | 91,0 | 100,0 | 4,2 | 5,5 | 12 | 80,0 | 56,0 | 15,6 | 0,553 | 45,17 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - | - | |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|------------------|-------|------------------------------------|------|---------------------|----------------------|--|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | | | | | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| | | | | | | | | | | | | x10 ³ | S355 | S460 | S355 | S460 | | | | | |
| HE 220 A | 50,5 | 5409 | 515,2 | 568,4 | 9,1 | 20,67 | 1954 | 177,6 | 270,5 | 5,5 | 5,0 | 28,61 | 193,2 | 2 | 3 | 2 | 3 | 161 | 195 | 99 | 134 |
| HE 220 AA | 40,4 | 4170 | 406,8 | 445,4 | 9,0 | 17,63 | 1510 | 137,3 | 209,3 | 5,4 | 4,4 | 15,54 | 145,6 | 3 | 4 | 3 | 4 | 200 | 242 | 122 | 165 |
| HE 200 M | 103 | 10640 | 967,4 | 1135 | 9,0 | 41,03 | 3651 | 354,4 | 543,2 | 5,2 | 8,6 | 257,5 | 346,2 | 1 | 1 | 1 | 1 | 76 | 92 | 49 | 65 |
| HE 200 C | 81,9 | 8029 | 764,7 | 880,6 | 8,7 | 32,78 | 2794 | 275,2 | 420,9 | 5,1 | 7,3 | 134,7 | 251,6 | 1 | 1 | 1 | 1 | 93 | 113 | 60 | 79 |
| HE 200 B | 61,3 | 5696 | 569,6 | 642,5 | 8,5 | 24,83 | 2003 | 200,3 | 305,8 | 5,0 | 6,0 | 59,70 | 171,1 | 1 | 1 | 1 | 1 | 122 | 147 | 77 | 102 |
| HE 200 A | 42,3 | 3692 | 388,6 | 429,4 | 8,2 | 18,08 | 1335 | 133,5 | 203,8 | 4,9 | 4,7 | 21,04 | 108,0 | 2 | 3 | 2 | 3 | 174 | 211 | 108 | 145 |
| HE 200 AA | 34,6 | 2944 | 316,5 | 347,0 | 8,1 | 15,45 | 1068 | 106,8 | 163,1 | 4,9 | 4,2 | 12,52 | 84,49 | 3 | 3 | 3 | 3 | 211 | 256 | 130 | 175 |
| HE 180 M | 88,9 | 7483 | 748,3 | 883,4 | 8,1 | 34,65 | 2580 | 277,4 | 425,1 | 4,7 | 8,0 | 201,1 | 199,3 | 1 | 1 | 1 | 1 | 80 | 96 | 52 | 68 |
| HE 180 C | 69,8 | 5543 | 583,4 | 675,0 | 7,8 | 27,29 | 1944 | 212,4 | 324,9 | 4,6 | 6,7 | 101,4 | 141,8 | 1 | 1 | 1 | 1 | 99 | 120 | 63 | 84 |
| HE 180 B | 51,2 | 3831 | 425,6 | 481,4 | 7,6 | 20,24 | 1362 | 151,4 | 231,0 | 4,5 | 5,4 | 42,21 | 93,74 | 1 | 1 | 1 | 1 | 131 | 159 | 83 | 110 |
| HE 180 A | 35,5 | 2510 | 293,6 | 324,8 | 7,4 | 14,47 | 924,6 | 102,7 | 156,4 | 4,5 | 4,2 | 14,88 | 60,21 | 2 | 3 | 2 | 3 | 187 | 226 | 115 | 155 |
| HE 180 AA | 28,7 | 1966 | 235,5 | 258,2 | 7,3 | 12,15 | 729,9 | 81,10 | 123,5 | 4,4 | 3,7 | 8,314 | 46,36 | 3 | 3 | 3 | 3 | 229 | 279 | 141 | 190 |
| HE 160 M | 76,2 | 5098 | 566,4 | 674,5 | 7,2 | 30,81 | 1758 | 211,8 | 325,4 | 4,2 | 7,7 | 160,5 | 108,0 | 1 | 1 | 1 | 1 | 83 | 100 | 54 | 71 |
| HE 160 C | 59,2 | 3704 | 435,7 | 507,6 | 7,0 | 24,05 | 1302 | 159,8 | 244,8 | 4,1 | 6,4 | 78,69 | 75,04 | 1 | 1 | 1 | 1 | 104 | 125 | 67 | 88 |
| HE 160 B | 42,6 | 2491 | 311,4 | 353,9 | 6,7 | 17,59 | 889,2 | 111,1 | 169,9 | 4,0 | 5,1 | 31,27 | 47,94 | 1 | 1 | 1 | 1 | 140 | 169 | 88 | 118 |
| HE 160 A | 30,4 | 1672 | 220,1 | 245,1 | 6,5 | 13,21 | 615,5 | 76,94 | 117,6 | 3,9 | 4,1 | 12,09 | 31,40 | 1 | 2 | 1 | 2 | 192 | 234 | 120 | 161 |
| HE 160 AA | 23,8 | 1282 | 173,3 | 190,4 | 6,5 | 10,37 | 478,7 | 59,84 | 91,36 | 3,9 | 3,6 | 6,431 | 23,75 | 3 | 3 | 3 | 3 | 244 | 297 | 150 | 203 |
| HE 140 M | 63,2 | 3291 | 411,4 | 493,8 | 6,3 | 24,45 | 1144 | 156,7 | 240,5 | 3,7 | 7,1 | 118,6 | 54,32 | 1 | 1 | 1 | 1 | 88 | 106 | 58 | 76 |
| HE 140 C | 48,2 | 2329 | 310,6 | 363,8 | 6,1 | 18,61 | 830,2 | 116,1 | 177,6 | 3,6 | 5,8 | 55,37 | 36,63 | 1 | 1 | 1 | 1 | 112 | 135 | 72 | 95 |
| HE 140 B | 33,7 | 1509 | 215,6 | 245,4 | 5,9 | 13,07 | 549,6 | 78,52 | 119,7 | 3,5 | 4,5 | 20,15 | 22,47 | 1 | 1 | 1 | 1 | 155 | 187 | 98 | 130 |
| HE 140 A | 24,7 | 1033 | 155,3 | 173,4 | 5,7 | 10,12 | 389,3 | 55,61 | 84,84 | 3,5 | 3,6 | 8,101 | 15,06 | 1 | 2 | 1 | 2 | 208 | 253 | 129 | 174 |
| HE 140 AA | 18,1 | 719,4 | 112,4 | 123,7 | 5,5 | 7,922 | 274,8 | 39,26 | 59,93 | 3,4 | 3,0 | 3,433 | 10,21 | 3 | 3 | 3 | 3 | 281 | 342 | 172 | 233 |
| HE 120 M | 52,1 | 2017 | 288,2 | 350,6 | 5,5 | 21,15 | 702,7 | 111,5 | 171,6 | 3,2 | 6,8 | 90,51 | 24,78 | 1 | 1 | 1 | 1 | 92 | 111 | 61 | 80 |
| HE 120 C | 39,2 | 1388 | 213,5 | 252,8 | 5,2 | 15,90 | 497,6 | 80,92 | 124,1 | 3,1 | 5,5 | 40,72 | 16,12 | 1 | 1 | 1 | 1 | 118 | 143 | 77 | 101 |
| HE 120 B | 26,7 | 864,3 | 144,0 | 165,2 | 5,0 | 10,96 | 317,5 | 52,92 | 80,96 | 3,0 | 4,2 | 13,93 | 9,409 | 1 | 1 | 1 | 1 | 167 | 202 | 106 | 141 |
| HE 120 A | 19,9 | 606,1 | 106,3 | 119,4 | 4,8 | 8,456 | 230,8 | 38,48 | 58,85 | 3,0 | 3,5 | 6,041 | 6,471 | 1 | 1 | 1 | 1 | 220 | 267 | 137 | 185 |
| HE 120 AA | 14,6 | 413,3 | 75,84 | 84,11 | 4,7 | 6,903 | 158,8 | 26,46 | 40,62 | 2,9 | 2,9 | 2,591 | 4,242 | 3 | 3 | 3 | 3 | 296 | 361 | 182 | 247 |
| HE 100 M | 41,8 | 1142 | 190,4 | 235,8 | 4,6 | 18,03 | 399,1 | 75,31 | 116,3 | 2,7 | 6,6 | 67,23 | 9,925 | 1 | 1 | 1 | 1 | 96 | 116 | 65 | 85 |
| HE 100 C | 30,9 | 758,6 | 137,9 | 165,7 | 4,3 | 13,38 | 274,3 | 53,27 | 82,07 | 2,6 | 5,3 | 29,10 | 6,163 | 1 | 1 | 1 | 1 | 125 | 151 | 82 | 108 |
| HE 100 B | 20,4 | 449,5 | 89,9 | 104,2 | 4,1 | 9,036 | 167,2 | 33,45 | 51,42 | 2,5 | 4,0 | 9,330 | 3,375 | 1 | 1 | 1 | 1 | 180 | 218 | 115 | 154 |
| HE 100 A | 16,7 | 349,2 | 72,75 | 83,01 | 4,0 | 7,556 | 133,8 | 26,76 | 41,14 | 2,5 | 3,5 | 5,283 | 2,581 | 1 | 1 | 1 | 1 | 217 | 264 | 138 | 185 |
| HE 100 AA | 12,2 | 236,5 | 51,97 | 58,35 | 3,8 | 6,147 | 92,06 | 18,41 | 28,44 | 2,4 | 2,9 | 2,325 | 1,675 | 1 | 2 | 1 | 2 | 290 | 355 | 181 | 245 |

Extra wide flange beams

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas con alas extra anchas

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

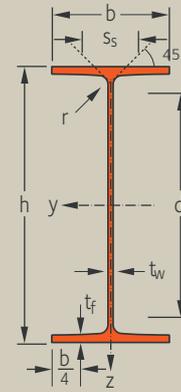
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki szerokostopowe

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | |
|---|--------------------------------------|----|----------------|----------------|----|----|---------------------------------------|-------------------|-------------------|---|---|----|-------------|-----------------|-------------|------|----|-------------|------------|--------|----|
| | h | b | t _w | t _f | r | d | A | A _L | A _G | S355 | | | S460 | | | S500 | | | | | |
| G kg/m | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML |

| | | | | | | | | | | | | | | | | | | | | | | | |
|------------|----|-----|--------|-------|------|------|----|-------|-------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| HLZ 1100 D | 40 | 453 | 1087,4 | 460,0 | 22,0 | 37,0 | 35 | 935,9 | 577,5 | 3,911 | 8,682 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HLZ 1100 C | 40 | 430 | 1083,4 | 459,0 | 21,0 | 35,0 | 35 | 935,9 | 548,3 | 3,901 | 9,124 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HLZ 1100 B | 40 | 408 | 1079,4 | 458,0 | 20,0 | 33,0 | 35 | 935,9 | 519,1 | 3,891 | 9,616 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HLZ 1100 A | 40 | 393 | 1075,4 | 458,0 | 20,0 | 31,0 | 35 | 935,9 | 500,8 | 3,883 | 9,950 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |

HI = HISTAR®

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazy na symboly na stranach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju A_p/V [m ⁻¹] | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|------------------|------------------------|------------------------------------|---------------------|------|-----------------------|--|----------------------|----------------------|----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | | | | | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| | | | | | | | | | | | | x10 ³ | S355 | S460 | S355 | S460 | | | | | |
| HLZ 1100 D | 453 | 1156300 | 21260 | 24050 | 44,8 | 267,5 | 60150 | 2615 | 4057 | 10,2 | 13,7 | 2131 | 165560 | 1 | 1 | 4 | 4 | 60 | 68 | 46 | 54 |
| HLZ 1100 C | 430 | 1091510 | 20140 | 22750 | 44,7 | 255,1 | 56520 | 2463 | 3817 | 10,1 | 13,2 | 1826 | 155000 | 1 | 1 | 4 | 4 | 63 | 72 | 48 | 57 |
| HLZ 1100 B | 408 | 1027360 | 19030 | 21470 | 44,6 | 242,8 | 52940 | 2312 | 3581 | 10,1 | 12,7 | 1553 | 144640 | 1 | 1 | 4 | 4 | 67 | 75 | 51 | 60 |
| HLZ 1100 A | 393 | 974190 | 18110 | 20480 | 44,2 | 241,0 | 49740 | 2172 | 3371 | 10,0 | 12,3 | 1358 | 135350 | 1 | 1 | 4 | 4 | 69 | 78 | 52 | 62 |

Extra wide flange beams

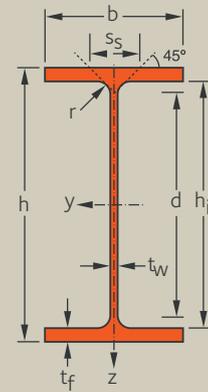
Dimensions: EN 10365:2017
 Tolerances: EN 10034:1993
 Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas con alas extra anchas

Dimensiones: EN 10365:2017
 Tolerancias: EN 10034:1993
 Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki szerokostopowe

Wymiary: EN 10365:2017
 Tolerancje: EN 10034:1993
 Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------------------|----------------------|---------|----------------------|---------|---------------------------------------|-------------------------------------|-------------------------------------|---|---|----|-----------------|-----------------|-------------------|---|----|-----------------|------------|--------|----|---|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | r mm | h _i mm | d mm | A cm ² | A _L m ² /m | A _C m ² /t | S355 | | | | S460 | | | | S500 | | | | |
| | | | | | | | | | | | | JR / IO / J2 / K2 | M | ML | JOW / J2W / K2W | MO / MLO / ML10 | JR / IO / J2 / K2 | M | ML | JOW / J2W / K2W | MLO / ML10 | JO / M | ML | |
| HL 1100 x 607 | 40 | 607 | 1138,0 | 410,0 | 31,0 | 55,0 | 30 | 1028,0 | 968,0 | 773,1 | 3,802 | 6,230 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | - | - |
| HL 1100 x 548 | 40 | 548 | 1128,0 | 407,0 | 28,0 | 50,0 | 30 | 1028,0 | 968,0 | 698,3 | 3,776 | 6,847 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | - | - |
| HL 1100 R | 40 | 499 | 1118,0 | 405,0 | 26,0 | 45,0 | 30 | 1028,0 | 968,0 | 635,2 | 3,752 | 7,474 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | - | - |
| HL 1100 M | 433 | 433 | 1108,0 | 402,0 | 22,0 | 40,0 | 30 | 1028,0 | 968,0 | 551,2 | 3,728 | 8,549 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 1100 B | 390 | 390 | 1100,0 | 400,0 | 20,0 | 36,0 | 30 | 1028,0 | 968,0 | 497,0 | 3,708 | 9,422 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 1100 A | 40 | 343 | 1090,0 | 400,0 | 18,0 | 31,0 | 30 | 1028,0 | 968,0 | 436,5 | 3,692 | 10,67 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 1000 x 976 | 40 | 976 | 1108,0 | 428,0 | 50,0 | 89,9 | 30 | 928,0 | 868,0 | 1241,4 | 3,776 | 3,875 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 1000 x 883 | 40 | 883 | 1092,0 | 424,0 | 45,5 | 82,0 | 30 | 928,0 | 868,0 | 1125,3 | 3,737 | 4,230 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 1000 x 748 | 40 | 748 | 1068,0 | 417,0 | 39,0 | 70,0 | 30 | 928,0 | 868,0 | 953,4 | 3,674 | 4,909 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | - | - |
| HL 1000 x 642 | 40 | 642 | 1048,0 | 412,0 | 34,0 | 60,0 | 30 | 928,0 | 868,0 | 817,6 | 3,624 | 5,646 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 1000 x 591 | 40 | 591 | 1040,0 | 409,0 | 31,0 | 55,9 | 30 | 928,0 | 868,0 | 752,7 | 3,602 | 6,096 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 1000 x 554 | 40 | 554 | 1032,0 | 408,0 | 29,5 | 52,0 | 30 | 928,0 | 868,0 | 705,8 | 3,585 | 6,470 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 1000 x 539 | 40 | 539 | 1030,0 | 407,0 | 28,4 | 51,1 | 30 | 928,0 | 868,0 | 687,2 | 3,580 | 6,637 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 1000 x 483 | 40 | 483 | 1020,0 | 404,0 | 25,4 | 46,0 | 30 | 928,0 | 868,0 | 615,1 | 3,554 | 7,360 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 1000 x 443 | 40 | 443 | 1012,0 | 402,0 | 23,6 | 41,9 | 30 | 928,0 | 868,0 | 563,7 | 3,533 | 7,985 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 1000 M | 40 | 412 | 1008,0 | 402,0 | 21,1 | 40,0 | 30 | 928,0 | 868,0 | 525,1 | 3,530 | 8,563 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 1000 B | 40 | 371 | 1000,0 | 400,0 | 19,0 | 36,1 | 30 | 928,0 | 868,0 | 472,8 | 3,510 | 9,457 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 1000 A | 40 | 321 | 990,0 | 400,0 | 16,5 | 31,0 | 30 | 928,0 | 868,0 | 408,8 | 3,495 | 10,89 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 1000 AA | 40 | 296 | 982,0 | 400,0 | 16,5 | 27,1 | 30 | 928,0 | 868,0 | 377,6 | 3,479 | 11,74 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 920 x 1377 | 40 | 1377 | 1093,0 | 473,0 | 76,7 | 115,1 | 25 | 862,8 | 812,8 | 1753,7 | 3,882 | 2,816 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 920 x 1269 | 40 | 1269 | 1093,0 | 461,0 | 64,0 | 115,1 | 25 | 862,8 | 812,8 | 1616,5 | 3,859 | 3,037 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 920 x 1194 | 40 | 1194 | 1081,0 | 457,0 | 60,5 | 109,0 | 25 | 862,8 | 812,8 | 1521,5 | 3,826 | 3,199 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 920 x 1077 | 40 | 1077 | 1061,0 | 451,0 | 55,0 | 99,1 | 25 | 862,8 | 812,8 | 1371,5 | 3,773 | 3,499 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 920 x 970 | 40 | 970 | 1043,0 | 446,0 | 50,0 | 89,9 | 25 | 862,8 | 812,8 | 1236,6 | 3,727 | 3,832 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 920 x 787 | 40 | 787 | 1011,0 | 437,0 | 40,9 | 73,9 | 25 | 862,8 | 812,8 | 1002,0 | 3,645 | 4,623 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HL 920 x 725 | 40 | 725 | 999,0 | 434,0 | 38,1 | 68,1 | 25 | 862,8 | 812,8 | 922,9 | 3,615 | 4,977 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | - | - |
| HL 920 x 656 | 40 | 656 | 987,0 | 431,0 | 34,5 | 62,0 | 25 | 862,8 | 812,8 | 835,3 | 3,586 | 5,454 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 920 x 588 | 40 | 588 | 975,0 | 427,0 | 31,0 | 55,9 | 25 | 862,8 | 812,8 | 748,1 | 3,553 | 6,032 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 920 x 537 | 40 | 537 | 965,0 | 425,0 | 28,4 | 51,1 | 25 | 862,8 | 812,8 | 682,5 | 3,530 | 6,567 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 920 x 491 | 40 | 491 | 957,0 | 422,0 | 25,9 | 47,0 | 25 | 862,8 | 812,8 | 623,3 | 3,507 | 7,142 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 920 x 449 | 40 | 449 | 948,0 | 423,0 | 24,0 | 42,7 | 25 | 862,8 | 812,8 | 571,4 | 3,497 | 7,766 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| HL 920 x 420 | 40 | 420 | 943,0 | 422,0 | 22,5 | 39,9 | 25 | 862,8 | 812,8 | 534,1 | 3,486 | 8,28 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 920 x 390 | 40 | 390 | 936,0 | 420,0 | 21,3 | 36,6 | 25 | 862,8 | 812,8 | 494,3 | 3,466 | 8,891 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 920 x 368 | 40 | 368 | 931,0 | 419,0 | 20,3 | 34,3 | 25 | 862,8 | 812,8 | 465,6 | 3,454 | 9,404 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| HL 920 x 344 | 40 | 344 | 927,0 | 418,0 | 19,3 | 32,0 | 25 | 862,8 | 812,8 | 437,2 | 3,444 | 9,984 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | | | | | |
|---|---|-------------------------------------|-------------------------------------|----------------------|------------------------------------|-----------------------------------|---|-------------------------------------|----------------------|----------------------|-----------------------------------|---|------------------------------------|------|------------------|------|--|----|----------------------|----|----------------------|--|----------------------|--|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiatka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | | | | |
| G kg/m | I _y cm ⁴ | W _{ely} cm ³ | W _{ply} cm ³ | i _y cm | A _{vz} cm ² | I _z cm ⁴ | W _{elz} cm ³ | W _{plz} cm ³ | i _z cm | S _s cm | I _t cm ⁴ | I _w cm ⁶ x10 ³ | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | | 4 faces/sides/Seiten | | 3 faces/sides/Seiten | | 4 faces/sides/Seiten | |
| HL 1100 x 607 | 607 | 1624100 | 28540 | 33000 | 45,7 | 376,4 | 63470 | 3096 | 4886 | 9,0 | 17,6 | 5789 | 185250 | 1 | 1 | 3 | 4 | 44 | 49 | 35 | 40 | | | |
| HL 1100 x 548 | 548 | 1456640 | 25820 | 29720 | 45,5 | 339,5 | 56400 | 2771 | 4358 | 8,9 | 16,3 | 4344 | 163220 | 1 | 1 | 4 | 4 | 48 | 54 | 38 | 44 | | | |
| HL 1100 R | 499 | 1305020 | 23340 | 26810 | 45,1 | 313,7 | 50000 | 2469 | 3879 | 8,8 | 15,1 | 3253 | 143400 | 1 | 1 | 4 | 4 | 52 | 59 | 41 | 48 | | | |
| HL 1100 M | 433 | 1136540 | 20510 | 23370 | 45,2 | 266,6 | 43420 | 2160 | 3370 | 8,8 | 13,7 | 2229 | 123500 | 1 | 1 | 4 | 4 | 60 | 67 | 47 | 54 | | | |
| HL 1100 B | 390 | 1016360 | 18470 | 20990 | 45,0 | 242,1 | 38490 | 1924 | 2995 | 8,7 | 12,7 | 1649 | 108680 | 1 | 1 | 4 | 4 | 66 | 74 | 52 | 60 | | | |
| HL 1100 A | 343 | 878350 | 16110 | 18270 | 44,6 | 216,9 | 33130 | 1656 | 2575 | 8,6 | 11,5 | 1104 | 92700 | 1 | 2 | 4 | 4 | 75 | 84 | 59 | 68 | | | |
| HL 1000 x 976 | 976 | 2348680 | 42390 | 50290 | 43,4 | 570,7 | 118520 | 5538 | 8838 | 9,7 | 26,4 | 24410 | 304410 | 1 | 1 | 1 | 1 | 27 | 30 | 21 | 25 | | | |
| HL 1000 x 883 | 883 | 2096410 | 38390 | 45260 | 43,1 | 516,4 | 104970 | 4951 | 7873 | 9,6 | 24,4 | 18510 | 265670 | 1 | 1 | 1 | 1 | 29 | 33 | 23 | 27 | | | |
| HL 1000 x 748 | 748 | 1731940 | 32430 | 37880 | 42,6 | 438,9 | 85110 | 4082 | 6459 | 9,4 | 21,4 | 11550 | 210640 | 1 | 1 | 1 | 1 | 34 | 39 | 27 | 31 | | | |
| HL 1000 x 642 | 642 | 1450580 | 27680 | 32090 | 42,1 | 379,6 | 70280 | 3411 | 5378 | 9,2 | 18,9 | 7381 | 170660 | 1 | 1 | 1 | 2 | 39 | 44 | 31 | 36 | | | |
| HL 1000 x 591 | 591 | 1331030 | 25590 | 29520 | 42,0 | 346,3 | 64010 | 3130 | 4915 | 9,2 | 17,7 | 5895 | 154320 | 1 | 1 | 2 | 3 | 42 | 48 | 33 | 38 | | | |
| HL 1000 x 554 | 554 | 1232370 | 23880 | 27490 | 41,7 | 328,0 | 59090 | 2896 | 4546 | 9,1 | 16,8 | 4834 | 141320 | 1 | 1 | 2 | 3 | 45 | 51 | 35 | 41 | | | |
| HL 1000 x 539 | 539 | 1202530 | 23350 | 26820 | 41,8 | 316,3 | 57630 | 2832 | 4435 | 9,1 | 16,5 | 4529 | 137550 | 1 | 1 | 2 | 4 | 46 | 52 | 36 | 42 | | | |
| HL 1000 x 483 | 483 | 1067480 | 20930 | 23920 | 41,6 | 282,7 | 50710 | 2510 | 3918 | 9,0 | 15,2 | 3306 | 119890 | 1 | 1 | 4 | 4 | 51 | 58 | 40 | 46 | | | |
| HL 1000 x 443 | 443 | 966510 | 19100 | 21770 | 41,4 | 261,8 | 45490 | 2263 | 3529 | 8,9 | 14,2 | 2543 | 106730 | 1 | 1 | 4 | 4 | 56 | 63 | 43 | 50 | | | |
| HL 1000 M | 412 | 910470 | 18060 | 20460 | 41,6 | 235,9 | 43400 | 2159 | 3348 | 9,0 | 13,6 | 2144 | 101450 | 1 | 1 | 4 | 4 | 60 | 67 | 46 | 54 | | | |
| HL 1000 B | 371 | 813730 | 16270 | 18360 | 41,4 | 212,5 | 38580 | 1929 | 2984 | 9,0 | 12,6 | 1588 | 89440 | 1 | 1 | 4 | 4 | 66 | 74 | 51 | 59 | | | |
| HL 1000 A | 321 | 696440 | 14060 | 15790 | 41,2 | 184,5 | 33120 | 1656 | 2554 | 9,0 | 11,3 | 1033 | 76020 | 1 | 2 | 4 | 4 | 76 | 85 | 58 | 68 | | | |
| HL 1000 AA | 296 | 620310 | 12630 | 14250 | 40,5 | 181,5 | 28960 | 1448 | 2242 | 8,7 | 10,5 | 763,6 | 65890 | 1 | 2 | 4 | 4 | 82 | 92 | 63 | 73 | | | |
| HL 920 x 1377 | 1377 | 3035400 | 55540 | 67740 | 41,5 | 812,9 | 206350 | 8725 | 14160 | 10,8 | 33,6 | 60450 | 485320 | 1 | 1 | 1 | 1 | 19 | 22 | 15 | 18 | | | |
| HL 920 x 1269 | 1269 | 2901080 | 53080 | 64020 | 42,3 | 688,7 | 189900 | 8238 | 13130 | 10,8 | 32,3 | 52120 | 449320 | 1 | 1 | 1 | 1 | 21 | 24 | 16 | 19 | | | |
| HL 920 x 1194 | 1194 | 2696760 | 49890 | 59910 | 42,0 | 647,9 | 175050 | 7660 | 12190 | 10,7 | 30,7 | 44110 | 409540 | 1 | 1 | 1 | 1 | 22 | 25 | 17 | 20 | | | |
| HL 920 x 1077 | 1077 | 2379090 | 44840 | 53450 | 41,6 | 583,9 | 152760 | 6774 | 10740 | 10,5 | 28,2 | 33050 | 350470 | 1 | 1 | 1 | 1 | 24 | 27 | 19 | 22 | | | |
| HL 920 x 970 | 970 | 2104260 | 40350 | 47750 | 41,2 | 526,8 | 133870 | 6003 | 9497 | 10,3 | 25,9 | 24680 | 301870 | 1 | 1 | 1 | 1 | 26 | 30 | 20 | 24 | | | |
| HL 920 x 787 | 787 | 1649860 | 32630 | 38110 | 40,5 | 425,5 | 103310 | 4728 | 7431 | 10,1 | 21,7 | 13650 | 225650 | 1 | 1 | 1 | 1 | 32 | 36 | 24 | 29 | | | |
| HL 920 x 725 | 725 | 1496530 | 29960 | 34830 | 40,2 | 394 | 93210 | 4295 | 6739 | 10,0 | 20,3 | 10750 | 201000 | 1 | 1 | 1 | 1 | 34 | 39 | 26 | 31 | | | |
| HL 920 x 656 | 656 | 1339430 | 27140 | 31360 | 39,9 | 355,4 | 83050 | 3854 | 6027 | 9,9 | 18,7 | 8098 | 176960 | 1 | 1 | 1 | 1 | 38 | 43 | 29 | 34 | | | |
| HL 920 x 588 | 588 | 1185310 | 24310 | 27940 | 39,7 | 318,2 | 72770 | 3408 | 5314 | 9,8 | 17,2 | 5923 | 153180 | 1 | 1 | 1 | 2 | 42 | 47 | 32 | 37 | | | |
| HL 920 x 537 | 537 | 1069610 | 22160 | 25360 | 39,5 | 290,4 | 65560 | 3085 | 4799 | 9,7 | 15,9 | 4542 | 136510 | 1 | 1 | 2 | 3 | 45 | 52 | 34 | 41 | | | |
| HL 920 x 491 | 491 | 970410 | 20280 | 23090 | 39,3 | 264,5 | 59010 | 2796 | 4339 | 9,7 | 14,9 | 3520 | 121870 | 1 | 1 | 3 | 4 | 49 | 56 | 37 | 44 | | | |
| HL 920 x 449 | 449 | 878790 | 18540 | 21040 | 39,1 | 243,9 | 53980 | 2552 | 3953 | 9,7 | 13,8 | 2692 | 110360 | 1 | 1 | 3 | 4 | 54 | 61 | 40 | 48 | | | |
| HL 920 x 420 | 420 | 817410 | 17330 | 19620 | 39,0 | 228,5 | 50070 | 2373 | 3671 | 9,6 | 13,1 | 2208 | 101890 | 1 | 1 | 4 | 4 | 57 | 65 | 43 | 51 | | | |
| HL 920 x 390 | 390 | 745810 | 15930 | 18010 | 38,7 | 215,2 | 45270 | 2156 | 3334 | 9,5 | 12,3 | 1741 | 91390 | 1 | 1 | 4 | 4 | 61 | 70 | 46 | 55 | | | |
| HL 920 x 368 | 368 | 696290 | 14950 | 16880 | 38,5 | 204,5 | 42120 | 2010 | 3108 | 9,4 | 11,8 | 1452 | 84530 | 1 | 1 | 4 | 4 | 65 | 74 | 49 | 58 | | | |
| HL 920 x 344 | 344 | 649060 | 14000 | 15790 | 38,4 | 194,1 | 39010 | 1866 | 2884 | 9,4 | 11,2 | 1198 | 78000 | 1 | 1 | 4 | 4 | 69 | 78 | 52 | 61 | | | |

Wide flange columns

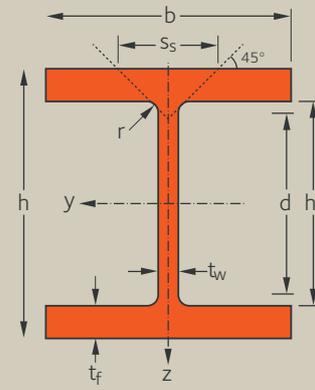
Dimensions: EN 10365:2017
 Tolerances: EN 10034:1993
 Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles H de alas anchas para pilares

Dimensiones: EN 10365:2017
 Tolerancias: EN 10034:1993
 Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Słupy szerokostopowe

Wymiary: EN 10365:2017
 Tolerancje: EN 10034:1993
 Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | |
|---|--------------------------------------|----|----------------|----------------|----|----------------|----|---------------------------------------|-------------------|-------------------|---|---|----|-------------|-----------------|-------------|------|----|-------------|------------|--------|----|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _C | S355 | | | S460 | | | S500 | | | | | |
| G kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|--|-------|-------|-------|-------|----|-------|-------|--------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| HD 400 x 1299 | 1299 | 600,0 | 476,0 | 100,0 | 140,0 | 20 | 320,0 | 280,0 | 1654,7 | 2,870 | 2,207 | ✓ | HI | - | - | - | ✓ | HI | - | - | - | ✓ | - |
| HD 400 x 1202 | 1202 | 580,0 | 471,0 | 95,0 | 130,0 | 20 | 320,0 | 280,0 | 1530,5 | 2,820 | 2,345 | ✓ | HI | - | - | - | ✓ | HI | - | - | - | ✓ | - |
| HD 400 x 1086 | 1086 | 569,0 | 454,0 | 78,0 | 125,0 | 20 | 320,0 | 280,0 | 1385,8 | 2,764 | 2,538 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 990 | 990 | 550,0 | 448,0 | 71,9 | 115,0 | 20 | 320,0 | 280,0 | 1262,4 | 2,714 | 2,735 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 900 | 900 | 531,0 | 442,0 | 65,9 | 106,0 | 20 | 320,0 | 280,0 | 1149,2 | 2,664 | 2,949 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 818 | 818 | 514,0 | 437,0 | 60,5 | 97,0 | 20 | 320,0 | 280,0 | 1043,3 | 2,621 | 3,196 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 744 | 744 | 498,0 | 432,0 | 55,6 | 88,9 | 20 | 320,0 | 280,0 | 948,1 | 2,578 | 3,459 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 677 | 677 | 483,0 | 428,0 | 51,2 | 81,5 | 20 | 320,0 | 280,0 | 863,4 | 2,541 | 3,743 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 634 | 634 | 474,0 | 424,0 | 47,6 | 77,1 | 20 | 320,0 | 280,0 | 808,0 | 2,514 | 3,956 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 592 | 592 | 465,0 | 421,0 | 45,0 | 72,3 | 20 | 320,0 | 280,0 | 754,9 | 2,490 | 4,194 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 551 | 551 | 455,0 | 418,0 | 42,0 | 67,6 | 20 | 320,0 | 280,0 | 701,4 | 2,464 | 4,466 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| HD 400 x 509 | 509 | 446,0 | 416,0 | 39,1 | 62,7 | 20 | 320,0 | 280,0 | 649,0 | 2,443 | 4,785 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 400 x 463 | 463 | 435,0 | 412,0 | 35,8 | 57,4 | 20 | 320,0 | 280,0 | 589,5 | 2,412 | 5,199 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 400 x 421 | 421 | 425,0 | 409,0 | 32,8 | 52,6 | 20 | 320,0 | 280,0 | 537,1 | 2,386 | 5,643 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 400 x 382 | 382 | 416,0 | 406,0 | 29,8 | 48,0 | 20 | 320,0 | 280,0 | 487,1 | 2,362 | 6,159 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 400 x 347 | 347 | 407,0 | 404,0 | 27,2 | 43,7 | 20 | 320,0 | 280,0 | 442,0 | 2,341 | 6,725 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 400 x 314 | 314 | 399,0 | 401,0 | 24,9 | 39,6 | 20 | 320,0 | 280,0 | 399,2 | 2,318 | 7,37 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 400 x 287 | 287 | 393,0 | 399,0 | 22,6 | 36,6 | 20 | 320,0 | 280,0 | 366,3 | 2,302 | 7,974 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 400 x 262 | 262 | 387,0 | 398,0 | 21,1 | 33,3 | 20 | 320,0 | 280,0 | 334,6 | 2,289 | 8,676 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 400 x 237 | 237 | 380,0 | 395,0 | 18,9 | 30,2 | 20 | 320,0 | 280,0 | 300,9 | 2,268 | 9,554 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 400 x 216 | 40 216 | 375,0 | 394,0 | 17,3 | 27,7 | 20 | 320,0 | 280,0 | 275,5 | 2,257 | 10,38 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 400 x 187 | 40 187 | 368,0 | 391,0 | 15,0 | 24,0 | 20 | 320,0 | 280,0 | 237,6 | 2,236 | 11,91 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |

HI = HISTAR®

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V[m-1] | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-----------------|---------------------|------------------------------------|------------------|------|--------------------|---|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | $\times 10^3$ | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| HD 400 x 1299 | 1299 | 754950 | 25160 | 33260 | 21,3 | 519,4 | 254410 | 10680 | 16670 | 12,3 | 40,3 | 95520 | 133120 | 1 | 1 | 1 | 1 | 14 | 17 | 10 | 13 |
| HD 400 x 1202 | 1202 | 663970 | 22890 | 30030 | 20,8 | 482,9 | 228760 | 9714 | 15150 | 12,2 | 37,8 | 77190 | 114600 | 1 | 1 | 1 | 1 | 15 | 18 | 11 | 14 |
| HD 400 x 1086 | 1086 | 596070 | 20950 | 27230 | 20,7 | 399,7 | 196270 | 8646 | 13380 | 11,8 | 35,1 | 61220 | 96070 | 1 | 1 | 1 | 1 | 17 | 20 | 11 | 15 |
| HD 400 x 990 | 990 | 519260 | 18880 | 24300 | 20,2 | 362,1 | 173380 | 7740 | 11960 | 11,7 | 32,5 | 47490 | 81520 | 1 | 1 | 1 | 1 | 18 | 21 | 12 | 16 |
| HD 400 x 900 | 900 | 450550 | 16970 | 21640 | 19,7 | 325,9 | 153360 | 6939 | 10710 | 11,5 | 30,1 | 36880 | 68880 | 1 | 1 | 1 | 1 | 19 | 23 | 13 | 17 |
| HD 400 x 818 | 818 | 392540 | 15270 | 19270 | 19,3 | 294,5 | 135540 | 6203 | 9566 | 11,3 | 27,7 | 28210 | 58650 | 1 | 1 | 1 | 1 | 21 | 25 | 14 | 18 |
| HD 400 x 744 | 744 | 342470 | 13750 | 17180 | 18,9 | 266,4 | 119940 | 5553 | 8553 | 11,2 | 25,6 | 21660 | 49980 | 1 | 1 | 1 | 1 | 23 | 27 | 15 | 20 |
| HD 400 x 677 | 677 | 299820 | 12410 | 15360 | 18,6 | 241,6 | 106880 | 4994 | 7684 | 11,1 | 23,7 | 16680 | 42910 | 1 | 1 | 1 | 1 | 24 | 29 | 16 | 21 |
| HD 400 x 634 | 634 | 274520 | 11580 | 14240 | 18,4 | 223,1 | 98260 | 4635 | 7121 | 11,0 | 22,5 | 13960 | 38570 | 1 | 1 | 1 | 1 | 26 | 31 | 17 | 22 |
| HD 400 x 592 | 592 | 250510 | 10770 | 13160 | 18,1 | 209,0 | 90180 | 4284 | 6578 | 10,9 | 21,3 | 11520 | 34660 | 1 | 1 | 1 | 1 | 27 | 33 | 18 | 23 |
| HD 400 x 551 | 551 | 226460 | 9954 | 12070 | 17,9 | 193,1 | 82500 | 3947 | 6055 | 10,8 | 20,0 | 9395 | 30870 | 1 | 1 | 1 | 1 | 29 | 35 | 19 | 25 |
| HD 400 x 509 | 509 | 204880 | 9187 | 11050 | 17,7 | 178,3 | 75410 | 3625 | 5556 | 10,7 | 18,7 | 7513 | 27630 | 1 | 1 | 1 | 1 | 31 | 38 | 20 | 27 |
| HD 400 x 463 | 463 | 180510 | 8299 | 9900 | 17,4 | 161,5 | 67040 | 3254 | 4981 | 10,6 | 17,4 | 5746 | 23840 | 1 | 1 | 1 | 1 | 34 | 41 | 22 | 29 |
| HD 400 x 421 | 421 | 159930 | 7526 | 8903 | 17,2 | 146,6 | 60080 | 2938 | 4492 | 10,5 | 16,1 | 4416 | 20790 | 1 | 1 | 1 | 1 | 37 | 44 | 23 | 31 |
| HD 400 x 382 | 382 | 141670 | 6811 | 7987 | 17,0 | 132,2 | 53620 | 2641 | 4033 | 10,4 | 14,9 | 3348 | 18120 | 1 | 1 | 1 | 1 | 40 | 48 | 25 | 34 |
| HD 400 x 347 | 347 | 125300 | 6157 | 7161 | 16,8 | 119,7 | 48090 | 2380 | 3631 | 10,4 | 13,8 | 2532 | 15840 | 1 | 1 | 1 | 1 | 44 | 53 | 27 | 37 |
| HD 400 x 314 | 314 | 110580 | 5543 | 6397 | 16,6 | 108,7 | 42600 | 2125 | 3239 | 10,3 | 12,7 | 1891 | 13740 | 1 | 1 | 1 | 1 | 48 | 58 | 30 | 40 |
| HD 400 x 287 | 287 | 100060 | 5092 | 5835 | 16,4 | 98,62 | 38780 | 1944 | 2959 | 10,2 | 11,9 | 1484 | 12300 | 1 | 1 | 1 | 1 | 52 | 63 | 32 | 43 |
| HD 400 x 262 | 262 | 89760 | 4638 | 5282 | 16,3 | 91,38 | 35020 | 1759 | 2678 | 10,2 | 11,1 | 1133 | 10940 | 1 | 1 | 1 | 1 | 56 | 68 | 35 | 47 |
| HD 400 x 237 | 237 | 79130 | 4164 | 4708 | 16,1 | 81,62 | 31040 | 1571 | 2389 | 10,1 | 10,2 | 841,9 | 9489 | 1 | 1 | 1 | 1 | 62 | 75 | 38 | 51 |
| HD 400 x 216 | 216 | 71490 | 3813 | 4285 | 16,0 | 74,59 | 28250 | 1434 | 2178 | 10,0 | 9,6 | 652,1 | 8514 | 1 | 1 | 1 | 1 | 67 | 81 | 41 | 56 |
| HD 400 x 187 | 187 | 60540 | 3290 | 3665 | 15,9 | 64,63 | 23920 | 1223 | 1856 | 10,0 | 8,6 | 426,9 | 7073 | 1 | 2 | 1 | 2 | 77 | 93 | 47 | 63 |

Wide flange columns (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles H de alas anchas para pilares (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

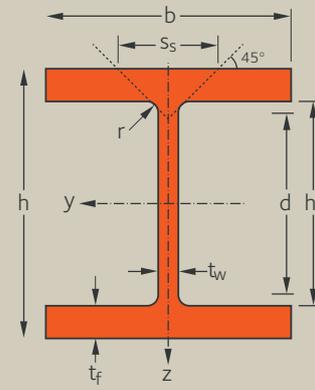
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Słupy szerokostopowe (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | | |
|---|--------------------------------------|------|----------------|----------------|------|----------------|----|---------------------------------------|-------------------|-------------------|---|-------|----|-------------|-----------------|-------------|----|----|-------------|------------|--------|----|---|---|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _C | S355 | | | | S460 | | | | S500 | | | | | |
| G kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML | | |
| HD 360 x 196 | 40 | 196 | 372,0 | 374,0 | 16,4 | 26,2 | 20 | 320,0 | 280,0 | 250,3 | 2,173 | 10,99 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 360 x 179 | 40 | 179 | 368,0 | 373,0 | 15,0 | 23,9 | 20 | 320,0 | 280,0 | 228,3 | 2,164 | 12,00 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 360 x 162 | 40 | 162 | 364,0 | 371,0 | 13,3 | 21,8 | 20 | 320,0 | 280,0 | 206,3 | 2,151 | 13,19 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 360 x 147 | 40 | 147 | 360,0 | 370,0 | 12,3 | 19,8 | 20 | 320,0 | 280,0 | 187,9 | 2,141 | 14,40 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 360 x 134 | | 134 | 356,0 | 369,0 | 11,2 | 18,0 | 20 | 320,0 | 280,0 | 170,6 | 2,131 | 15,77 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 320 x 300 | | 300 | 375,0 | 313,0 | 27,0 | 48,0 | 27 | 279,0 | 225,0 | 382,1 | 1,902 | 6,342 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 320 x 245 | | 245 | 359,0 | 309,0 | 21,0 | 40,0 | 27 | 279,0 | 225,0 | 312,0 | 1,866 | 7,618 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| HD 320 x 198 | | 198 | 343,0 | 306,0 | 18,0 | 32,0 | 27 | 279,0 | 225,0 | 252,3 | 1,828 | 9,229 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 320 x 158 | | 158 | 330,0 | 303,0 | 14,5 | 25,5 | 27 | 279,0 | 225,0 | 201,2 | 1,797 | 11,38 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 320 x 127 | | 127 | 320,0 | 300,0 | 11,5 | 20,5 | 27 | 279,0 | 225,0 | 161,3 | 1,771 | 13,98 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 320 x 97,6 | | 97,6 | 310,0 | 300,0 | 9,0 | 15,5 | 27 | 279,0 | 225,0 | 124,4 | 1,756 | 17,99 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 320 x 74,2 | 40 | 74,2 | 301,0 | 300,0 | 8,0 | 11,0 | 27 | 279,0 | 225,0 | 94,6 | 1,740 | 23,44 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | |
| HD 260 x 299 | | 299 | 335,0 | 278,0 | 31,0 | 55,0 | 24 | 225,0 | 177,0 | 380,5 | 1,679 | 5,621 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 260 x 225 | | 225 | 309,0 | 271,0 | 24,0 | 42,0 | 24 | 225,0 | 177,0 | 286,6 | 1,613 | 7,170 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| HD 260 x 172 | | 172 | 290,0 | 268,0 | 18,0 | 32,5 | 24 | 225,0 | 177,0 | 219,6 | 1,575 | 9,135 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 260 x 142 | | 142 | 278,0 | 265,0 | 15,5 | 26,5 | 24 | 225,0 | 177,0 | 180,3 | 1,544 | 10,91 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 260 x 114 | | 114 | 268,0 | 262,0 | 12,5 | 21,5 | 24 | 225,0 | 177,0 | 145,7 | 1,518 | 13,27 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 260 x 93,0 | | 93,0 | 260,0 | 260,0 | 10,0 | 17,5 | 24 | 225,0 | 177,0 | 118,4 | 1,499 | 16,12 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 260 x 68,2 | | 68,2 | 250,0 | 260,0 | 7,5 | 12,5 | 24 | 225,0 | 177,0 | 86,8 | 1,484 | 21,77 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HD 260 x 54,1 | 40 | 54,1 | 244,0 | 260,0 | 6,5 | 9,5 | 24 | 225,0 | 177,0 | 69,0 | 1,474 | 27,23 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.
Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.
Plazo mínimo y condiciones de entrega previo acuerdo

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
Minimalny tonaż i warunki dostawy po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazy na symboly na stranach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V[m-1] | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-----------------|------------------------|------------------------------------|---------------------|-----------|-----------------------|---|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (szybwa) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | S_{355} | S_{460} | S_{355} | S_{460} | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | |
| HD 360 x 196 | 196 | 63980 | 3440 | 3860 | 15,9 | 70,62 | 22860 | 1222 | 1858 | 9,5 | 9,2 | 530,9 | 6828 | 1 | 1 | 1 | 1 | 71 | 86 | 44 | 59 |
| HD 360 x 179 | 179 | 57790 | 3141 | 3505 | 15,8 | 64,6 | 20680 | 1109 | 1684 | 9,4 | 8,6 | 406 | 6119 | 1 | 2 | 1 | 2 | 78 | 94 | 48 | 65 |
| HD 360 x 162 | 162 | 51890 | 2851 | 3162 | 15,8 | 57,66 | 18560 | 1000 | 1518 | 9,4 | 8,0 | 306,6 | 5431 | 1 | 3 | 1 | 3 | 86 | 104 | 53 | 71 |
| HD 360 x 147 | 147 | 46640 | 2591 | 2861 | 15,6 | 53,19 | 16720 | 904 | 1371 | 9,3 | 7,5 | 233,3 | 4836 | 2 | 3 | 2 | 3 | 94 | 113 | 58 | 77 |
| HD 360 x 134 | 134 | 41860 | 2352 | 2585 | 15,5 | 48,48 | 15080 | 817,3 | 1238 | 9,3 | 7,0 | 177,3 | 4305 | 3 | 3 | 3 | 3 | 102 | 124 | 63 | 84 |
| HD 320 x 300 | 300 | 86900 | 4634 | 5521 | 15,0 | 120,4 | 24600 | 1572 | 2414 | 8,0 | 15,4 | 2631 | 6557 | 1 | 1 | 1 | 1 | 42 | 50 | 28 | 36 |
| HD 320 x 245 | 245 | 68130 | 3795 | 4435 | 14,7 | 94,84 | 19700 | 1275 | 1950 | 7,9 | 13,2 | 1506 | 5003 | 1 | 1 | 1 | 1 | 50 | 60 | 33 | 43 |
| HD 320 x 198 | 198 | 51890 | 3025 | 3479 | 14,3 | 79,51 | 15310 | 1000 | 1530 | 7,7 | 11,3 | 808,5 | 3695 | 1 | 1 | 1 | 1 | 60 | 72 | 39 | 51 |
| HD 320 x 158 | 158 | 39640 | 2402 | 2718 | 14,0 | 64,18 | 11840 | 781,6 | 1193 | 7,6 | 9,7 | 424,9 | 2740 | 1 | 1 | 1 | 1 | 74 | 89 | 48 | 63 |
| HD 320 x 127 | 127 | 30820 | 1926 | 2149 | 13,8 | 51,77 | 9238 | 615,9 | 939 | 7,5 | 8,4 | 230,4 | 2068 | 1 | 1 | 1 | 1 | 91 | 110 | 58 | 77 |
| HD 320 x 97,6 | 97,6 | 22920 | 1479 | 1628 | 13,5 | 41,13 | 6985 | 465,6 | 709,7 | 7,4 | 7,1 | 111,8 | 1512 | 2 | 3 | 2 | 3 | 117 | 141 | 74 | 98 |
| HD 320 x 74,2 | 74,2 | 16440 | 1092 | 1196 | 13,1 | 35,39 | 4959 | 330,6 | 505,7 | 7,2 | 6,1 | 53,58 | 1040 | 3 | 4 | 3 | 4 | 152 | 184 | 95 | 127 |
| HD 260 x 299 | 299 | 64210 | 3833 | 4726 | 12,9 | 118,1 | 19770 | 1422 | 2189 | 7,2 | 16,9 | 3392 | 3860 | 1 | 1 | 1 | 1 | 37 | 44 | 25 | 32 |
| HD 260 x 225 | 225 | 43750 | 2831 | 3395 | 12,3 | 89,18 | 13970 | 1031 | 1583 | 6,9 | 13,6 | 1533 | 2482 | 1 | 1 | 1 | 1 | 47 | 56 | 31 | 40 |
| HD 260 x 172 | 172 | 31300 | 2159 | 2523 | 11,9 | 66,89 | 10440 | 779,7 | 1192 | 6,8 | 11,1 | 720,1 | 1728 | 1 | 1 | 1 | 1 | 59 | 72 | 39 | 51 |
| HD 260 x 142 | 142 | 24330 | 1750 | 2015 | 11,6 | 56,64 | 8235 | 621,5 | 950,4 | 6,7 | 9,6 | 407,3 | 1299 | 1 | 1 | 1 | 1 | 71 | 86 | 46 | 60 |
| HD 260 x 114 | 114 | 18910 | 1411 | 1599 | 11,3 | 46,07 | 6455 | 492,8 | 752,4 | 6,6 | 8,3 | 224,5 | 978,9 | 1 | 1 | 1 | 1 | 86 | 104 | 55 | 73 |
| HD 260 x 93,0 | 93,0 | 14910 | 1147 | 1282 | 11,2 | 37,59 | 5134 | 394,9 | 602,2 | 6,5 | 7,3 | 126,6 | 753,6 | 1 | 1 | 1 | 1 | 105 | 127 | 66 | 88 |
| HD 260 x 68,2 | 68,2 | 10450 | 836,3 | 919,7 | 10,9 | 28,75 | 3667 | 282,1 | 430,1 | 6,4 | 6,0 | 54,19 | 516,3 | 3 | 3 | 3 | 3 | 141 | 171 | 88 | 117 |
| HD 260 x 54,1 | 54,1 | 7980 | 654,1 | 714,4 | 10,7 | 24,74 | 2788 | 214,4 | 327,7 | 6,3 | 5,3 | 30,09 | 382,5 | 3 | 4 | 3 | 4 | 176 | 214 | 108 | 146 |

Wide flange bearing piles

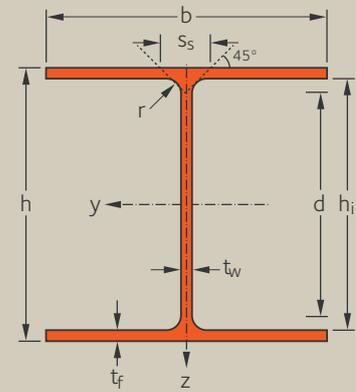
Dimensions: EN 10365:2017
Tolerances: EN 10034:1993
Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles de alas anchas para pilotes

Dimensiones: EN 10365:2017
Tolerancias: EN 10034:1993
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Szerokostopowe pale nośne

Wymiary: EN 10365: 2017
Tolerancje: EN 10034: 1993
Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | | |
|---|--------------------------------------|------|-------|----------------|----------------|------|----------------|---------------------------------------|-----------------|-------------------|---|-------------|---|----|-------------|-----------------|-------------|---|------|-------------|------------|--------|----|---|
| | G | h | b | t _w | t _f | r | h _i | d | A | A _L | A _C | S355 | | | S460 | | | | S500 | | | | | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML | |
| HP 400 x 231 | 40 | 231 | 372,0 | 402,0 | 26,0 | 26,0 | 20 | 320,0 | 280,0 | 294,2 | 2,266 | 9,763 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 400 x 213 | 40 | 213 | 368,0 | 400,0 | 24,0 | 24,0 | 20 | 320,0 | 280,0 | 270,7 | 2,254 | 10,55 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 400 x 194 | 40 | 194 | 364,0 | 398,0 | 22,0 | 22,0 | 20 | 320,0 | 280,0 | 247,5 | 2,242 | 11,47 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 400 x 176 | 40 | 176 | 360,0 | 396,0 | 20,0 | 20,0 | 20 | 320,0 | 280,0 | 224,3 | 2,230 | 12,58 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 400 x 158 | 40 | 158 | 356,0 | 394,0 | 18,0 | 18,0 | 20 | 320,0 | 280,0 | 201,4 | 2,218 | 13,93 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 400 x 140 | 40 | 140 | 352,0 | 392,0 | 16,0 | 16,0 | 20 | 320,0 | 280,0 | 178,6 | 2,206 | 15,61 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 400 x 122 | 40 | 122 | 348,0 | 390,0 | 14,0 | 14,0 | 20 | 320,0 | 280,0 | 155,9 | 2,194 | 17,75 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | |
| HP 360 x 180 | 40 | 180 | 362,9 | 378,8 | 21,1 | 21,1 | 20 | 320,6 | 280,6 | 229,5 | 2,164 | 11,94 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 360 x 174 | 40 | 174 | 361,4 | 378,5 | 20,3 | 20,4 | 20 | 320,6 | 280,6 | 221,5 | 2,162 | 12,35 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 360 x 152 | 40 | 152 | 356,4 | 376,0 | 17,8 | 17,9 | 20 | 320,6 | 280,6 | 193,7 | 2,147 | 14,02 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 360 x 133 | 40 | 133 | 352,0 | 373,8 | 15,6 | 15,7 | 20 | 320,6 | 280,6 | 169,4 | 2,134 | 15,91 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 360 x 109 | 40 | 109 | 346,4 | 371,0 | 12,8 | 12,9 | 20 | 320,6 | 280,6 | 138,7 | 2,117 | 19,24 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | |
| HP 320 x 184 | ☎ | 184 | 329,0 | 317,0 | 25,0 | 25,0 | 27 | 279,0 | 225,0 | 234,5 | 1,830 | 9,941 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 320 x 147 | ☎ | 147 | 319,0 | 312,0 | 20,0 | 20,0 | 27 | 279,0 | 225,0 | 186,9 | 1,800 | 12,27 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 320 x 117 | ☎ | 117 | 311,0 | 308,0 | 16,0 | 16,0 | 27 | 279,0 | 225,0 | 149,5 | 1,776 | 15,14 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 320 x 103 | ☎ | 103 | 307,0 | 306,0 | 14,0 | 14,0 | 27 | 279,0 | 225,0 | 131,0 | 1,764 | 17,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 320 x 88 | ☎ | 88,5 | 303,0 | 304,0 | 12,0 | 12,0 | 27 | 279,0 | 225,0 | 112,7 | 1,752 | 19,80 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | |
| HP 305 x 223 | 40 | 223 | 337,9 | 325,7 | 30,3 | 30,4 | 20 | 277,1 | 237,1 | 284,0 | 1,884 | 8,409 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 305 x 186 | 40 | 186 | 328,3 | 320,9 | 25,5 | 25,6 | 20 | 277,1 | 237,1 | 236,9 | 1,855 | 9,912 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 305 x 180 | 40 | 180 | 326,7 | 319,7 | 24,8 | 24,8 | 20 | 277,1 | 237,1 | 229,3 | 1,848 | 10,20 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 305 x 149 | 40 | 149 | 318,5 | 316,0 | 20,6 | 20,7 | 20 | 277,1 | 237,1 | 189,9 | 1,825 | 12,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 305 x 126 | 40 | 126 | 312,3 | 312,9 | 17,5 | 17,6 | 20 | 277,1 | 237,1 | 160,6 | 1,807 | 14,20 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 305 x 110 | 40 | 110 | 307,9 | 310,7 | 15,3 | 15,4 | 20 | 277,1 | 237,1 | 140,1 | 1,794 | 16,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| HP 305 x 95 | 40 | 94,9 | 303,7 | 308,7 | 13,3 | 13,3 | 20 | 277,1 | 237,1 | 121,0 | 1,781 | 18,54 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | |
| HP 305 x 88 | 40 | 88,5 | 301,7 | 307,8 | 12,4 | 12,3 | 20 | 277,1 | 237,1 | 112,1 | 1,775 | 19,92 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | |
| HP 305 x 79 | 40 | 78,9 | 299,3 | 306,4 | 11,0 | 11,1 | 20 | 277,1 | 237,1 | 100,5 | 1,768 | 22,09 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | |
| HP 260 x 87 | | 87,3 | 253,0 | 267,0 | 14,0 | 14,0 | 24 | 225,0 | 177,0 | 111,0 | 1,505 | 17,24 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | |
| HP 260 x 75 | | 75,0 | 249,0 | 265,0 | 12,0 | 12,0 | 24 | 225,0 | 177,0 | 95,5 | 1,493 | 19,91 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ | - | - | |
| HP 220 x 57 | | 57,2 | 210,0 | 224,5 | 11,0 | 11,0 | 18 | 188,0 | 152,0 | 72,9 | 1,265 | 22,12 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | |
| HP 200 x 53 | | 53,5 | 204,0 | 207,0 | 11,3 | 11,3 | 10 | 181,4 | 161,4 | 68,4 | 1,196 | 22,36 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | |
| HP 200 x 43 | | 42,5 | 200,0 | 205,0 | 9,0 | 9,0 | 10 | 182,0 | 162,0 | 54,1 | 1,185 | 27,88 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | |

HI = HISTAR®

☎ Minimum order: 40t per section and grade or upon agreement.
☎ Minimum tonnage and delivery conditions upon agreement.

☎ Pedido mínimo: 40t por sección y grado o previo acuerdo
☎ Plazo mínimo y condiciones de entrega previo acuerdo

☎ Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
☎ Minimalny tonaż i warunki dostawy po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosiłniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | |
|---|---|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|------------------------------------|---|-------------------------------------|-------------------------------------|----------------------|----------------------|-----------------------------------|---|------------------------------------|---------------------|------|-----------------------|--|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | G kg/m | I _y cm ⁴ | W _{ely} cm ³ | W _{ply} cm ³ | i _y cm | A _{vz} cm ² | I _z cm ⁴ | W _{elz} cm ³ | W _{plz} cm ³ | i _z cm | S _s cm | I _t cm ⁴ | I _w cm ⁶ x10 ³ | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| HP 400 x 231 | 231 | 70610 | 3796 | 4335 | 15,4 | 103,7 | 28200 | 1403 | 2160 | 9,7 | 10,1 | 733,0 | 8425 | 1 | 2 | 1 | 2 | 63 | 77 | 39 | 52 |
| HP 400 x 213 | 213 | 64270 | 3493 | 3970 | 15,3 | 95,59 | 25640 | 1282 | 1971 | 9,7 | 9,5 | 577,2 | 7573 | 1 | 2 | 1 | 2 | 68 | 83 | 42 | 56 |
| HP 400 x 194 | 194 | 58110 | 3193 | 3611 | 15,2 | 87,47 | 23150 | 1163 | 1786 | 9,6 | 8,9 | 445,7 | 6759 | 2 | 3 | 2 | 3 | 74 | 90 | 45 | 61 |
| HP 400 x 176 | 176 | 52120 | 2895 | 3258 | 15,1 | 79,43 | 20720 | 1046 | 1605 | 9,5 | 8,3 | 336,3 | 5982 | 3 | 3 | 3 | 3 | 81 | 99 | 49 | 67 |
| HP 400 x 158 | 158 | 46290 | 2600 | 2911 | 15,1 | 71,47 | 18370 | 932,5 | 1427 | 9,5 | 7,7 | 246,7 | 5240 | 3 | 3 | 3 | 3 | 90 | 109 | 55 | 74 |
| HP 400 x 140 | 140 | 40630 | 2308 | 2570 | 15,0 | 63,59 | 16070 | 820,3 | 1254 | 9,4 | 7,1 | 175,0 | 4533 | 3 | 4 | 3 | 4 | 101 | 122 | 61 | 83 |
| HP 400 x 122 | 122 | 35120 | 2018 | 2235 | 14,9 | 55,79 | 13850 | 710,4 | 1084 | 9,3 | 6,5 | 119,1 | 3860 | 4 | 4 | 4 | 4 | 115 | 139 | 69 | 94 |
| HP 360 x 180 | 180 | 53380 | 2941 | 3327 | 15,2 | 83,99 | 19140 | 1010 | 1554 | 9,1 | 8,6 | 382,6 | 5582 | 2 | 3 | 2 | 3 | 77 | 94 | 48 | 64 |
| HP 360 x 174 | 174 | 51350 | 2841 | 3208 | 15,1 | 80,81 | 18460 | 975,7 | 1499 | 9,0 | 8,4 | 344,9 | 5359 | 2 | 3 | 2 | 3 | 80 | 97 | 49 | 66 |
| HP 360 x 152 | 152 | 44310 | 2486 | 2789 | 15,0 | 70,84 | 15880 | 844,6 | 1295 | 9,0 | 7,7 | 234,8 | 4542 | 3 | 3 | 3 | 3 | 91 | 110 | 56 | 75 |
| HP 360 x 133 | 133 | 38320 | 2177 | 2427 | 14,9 | 62,17 | 13680 | 732,0 | 1120 | 8,9 | 7,0 | 160,2 | 3864 | 3 | 4 | 3 | 4 | 103 | 125 | 63 | 85 |
| HP 360 x 109 | 109 | 30970 | 1788 | 1978 | 14,8 | 51,28 | 10980 | 592,4 | 904,6 | 8,8 | 6,2 | 91,19 | 3052 | 4 | 4 | 4 | 4 | 125 | 151 | 76 | 102 |
| HP 320 x 184 | 184 | 42340 | 2574 | 2979 | 13,4 | 95,75 | 13330 | 841,1 | 1311 | 7,5 | 10,6 | 586,4 | 3066 | 1 | 1 | 1 | 1 | 65 | 78 | 42 | 55 |
| HP 320 x 147 | 147 | 32670 | 2048 | 2338 | 13,2 | 76,85 | 10160 | 651,2 | 1011 | 7,3 | 9,1 | 309,6 | 2262 | 1 | 1 | 1 | 1 | 80 | 96 | 51 | 68 |
| HP 320 x 117 | 117 | 25470 | 1638 | 1848 | 13,0 | 62,09 | 7814 | 507,4 | 785,5 | 7,2 | 7,9 | 166,9 | 1695 | 2 | 3 | 2 | 3 | 98 | 119 | 62 | 83 |
| HP 320 x 103 | 103 | 22050 | 1436 | 1611 | 12,9 | 54,83 | 6704 | 438,1 | 677,2 | 7,1 | 7,3 | 116,8 | 1434 | 3 | 3 | 3 | 3 | 111 | 135 | 70 | 94 |
| HP 320 x 88 | 88,5 | 18740 | 1237 | 1378 | 12,8 | 47,65 | 5633 | 370,6 | 572 | 7,0 | 6,7 | 78,74 | 1189 | 3 | 3 | 3 | 3 | 128 | 155 | 81 | 108 |
| HP 305 x 223 | 223 | 52950 | 3134 | 3672 | 13,6 | 108,7 | 17580 | 1079 | 1682 | 7,8 | 11,4 | 977,0 | 4138 | 1 | 1 | 1 | 1 | 55 | 66 | 35 | 46 |
| HP 305 x 186 | 186 | 42860 | 2611 | 3022 | 13,4 | 90,86 | 14140 | 881,7 | 1369 | 7,7 | 10,0 | 583,3 | 3229 | 1 | 1 | 1 | 1 | 64 | 78 | 41 | 54 |
| HP 305 x 180 | 180 | 41220 | 2523 | 2915 | 13,3 | 88,22 | 13550 | 847,7 | 1315 | 7,6 | 9,7 | 532,2 | 3077 | 1 | 1 | 1 | 1 | 66 | 80 | 42 | 56 |
| HP 305 x 149 | 149 | 33320 | 2092 | 2389 | 13,1 | 73,06 | 10910 | 690,7 | 1067 | 7,5 | 8,5 | 310,3 | 2413 | 1 | 1 | 1 | 1 | 79 | 95 | 50 | 66 |
| HP 305 x 126 | 126 | 27660 | 1771 | 2004 | 13,0 | 62,04 | 9005 | 575,5 | 887,3 | 7,4 | 7,6 | 192,8 | 1951 | 1 | 3 | 1 | 3 | 92 | 111 | 58 | 77 |
| HP 305 x 110 | 110 | 23810 | 1547 | 1739 | 12,9 | 54,34 | 7712 | 496,4 | 763,6 | 7,3 | 6,9 | 131,0 | 1646 | 3 | 3 | 3 | 3 | 105 | 127 | 65 | 87 |
| HP 305 x 95 | 94,9 | 20300 | 1336 | 1493 | 12,8 | 47,37 | 6531 | 423,1 | 649,7 | 7,3 | 6,3 | 86,88 | 1374 | 3 | 3 | 3 | 3 | 120 | 146 | 75 | 100 |
| HP 305 x 88 | 88,5 | 18680 | 1238 | 1379 | 12,8 | 44,23 | 5986 | 389,0 | 596,9 | 7,2 | 6,0 | 70,29 | 1251 | 3 | 4 | 3 | 4 | 129 | 156 | 80 | 107 |
| HP 305 x 79 | 78,9 | 16690 | 1115 | 1237 | 12,7 | 39,57 | 5328 | 347,8 | 532,8 | 7,2 | 5,6 | 52,15 | 1105 | 4 | 4 | 4 | 4 | 143 | 173 | 89 | 119 |
| HP 260 x 87 | 87,3 | 12580 | 994,9 | 1123 | 10,6 | 45,12 | 4455 | 333,7 | 516,1 | 6,3 | 7,0 | 96,57 | 634,2 | 1 | 3 | 1 | 3 | 111 | 135 | 70 | 94 |
| HP 260 x 75 | 75,0 | 10640 | 855,1 | 958,5 | 10,5 | 39,14 | 3732 | 281,7 | 435,0 | 6,2 | 6,4 | 64,28 | 522,6 | 3 | 3 | 3 | 3 | 129 | 156 | 80 | 108 |
| HP 220 x 57 | 57,2 | 5729 | 545,6 | 613,6 | 8,8 | 28,63 | 2079 | 185,2 | 285,5 | 5,3 | 5,4 | 37,61 | 205,3 | 2 | 3 | 2 | 3 | 143 | 174 | 88 | 119 |
| HP 200 x 53 | 53,5 | 4977 | 487,9 | 551,2 | 8,5 | 24,89 | 1673 | 161,6 | 248,5 | 4,9 | 4,5 | 31,94 | 155,0 | 2 | 3 | 2 | 3 | 145 | 176 | 90 | 121 |
| HP 200 x 43 | 42,5 | 3887 | 388,7 | 434,5 | 8,4 | 19,84 | 1293 | 126,2 | 193,3 | 4,8 | 3,8 | 16,34 | 117,8 | 3 | 3 | 3 | 3 | 181 | 219 | 112 | 150 |

Wide flange bearing piles

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Pilotes con alas anchas

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

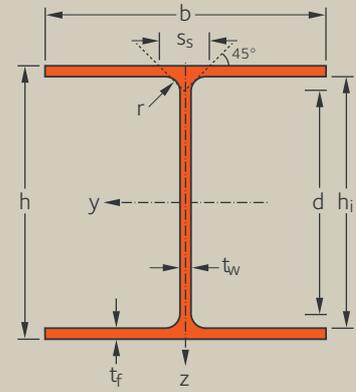
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Szerokostopowe pale nośne

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | |
|--|--------------------------------------|-------|----------------|----------------|------|----------------|-------|---------------------------------------|-------------------|-------------------|---|---|----|-------------|-----------------|-------------|---|----|-------------|------------|--------|----|---|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _C | S355 | | | | S460 | | | | S500 | | | | |
| G kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML | |
| UBP 356 x 368 x 174 40 | 174 | 361,4 | 378,5 | 20,3 | 20,4 | 20 | 320,6 | 280,6 | 221,5 | 2,162 | 12,35 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 356 x 368 x 152 40 | 152 | 356,4 | 376,0 | 17,8 | 17,9 | 20 | 320,6 | 280,6 | 193,7 | 2,147 | 14,02 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 356 x 368 x 133 40 | 133 | 352,0 | 373,8 | 15,6 | 15,7 | 20 | 320,6 | 280,6 | 169,4 | 2,134 | 15,91 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 356 x 368 x 109 40 | 109 | 346,4 | 371,0 | 12,8 | 12,9 | 20 | 320,6 | 280,6 | 138,7 | 2,117 | 19,24 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| UBP 305 x 305 x 223 40 | 223 | 337,9 | 325,7 | 30,3 | 30,4 | 20 | 277,1 | 237,1 | 284,0 | 1,884 | 8,409 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 305 x 305 x 186 40 | 186 | 328,3 | 320,9 | 25,5 | 25,6 | 20 | 277,1 | 237,1 | 236,9 | 1,855 | 9,912 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 305 x 305 x 149 40 | 149 | 318,5 | 316,0 | 20,6 | 20,7 | 20 | 277,1 | 237,1 | 189,9 | 1,825 | 12,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 305 x 305 x 126 40 | 126 | 312,3 | 312,9 | 17,5 | 17,6 | 20 | 277,1 | 237,1 | 160,6 | 1,807 | 14,20 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 305 x 305 x 110 40 | 110 | 307,9 | 310,7 | 15,3 | 15,4 | 20 | 277,1 | 237,1 | 140,1 | 1,794 | 16,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 305 x 305 x 95 40 | 94,9 | 303,7 | 308,7 | 13,3 | 13,3 | 20 | 277,1 | 237,1 | 120,9 | 1,781 | 18,54 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| UBP 305 x 305 x 88 40 | 88,0 | 301,7 | 307,8 | 12,4 | 12,3 | 20 | 277,1 | 237,1 | 112,1 | 1,775 | 19,92 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| UBP 305 x 305 x 79 40 | 78,9 | 299,3 | 306,4 | 11,0 | 11,1 | 20 | 277,1 | 237,1 | 100,5 | 1,768 | 22,09 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| UBP 254 x 254 x 85 | 85,1 | 254,3 | 260,4 | 14,4 | 14,3 | 13 | 225,7 | 199,7 | 108,4 | 1,499 | 17,61 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UBP 254 x 254 x 71 40 | 71,0 | 249,7 | 258,0 | 12,0 | 12,0 | 13 | 225,7 | 199,7 | 90,4 | 1,485 | 20,91 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| UBP 254 x 254 x 63 | 63,0 | 247,1 | 256,6 | 10,6 | 10,7 | 13 | 225,7 | 199,7 | 80,2 | 1,477 | 23,43 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | - | - |
| UBP 203 x 203 x 54 | 53,9 | 204,0 | 207,7 | 11,3 | 11,4 | 10 | 181,2 | 161,2 | 68,7 | 1,199 | 22,24 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UBP 203 x 203 x 45 | 44,9 | 200,2 | 205,9 | 9,5 | 9,5 | 10 | 181,2 | 161,2 | 57,2 | 1,188 | 26,46 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.
Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.
Plazo mínimo y condiciones de entrega previo acuerdo

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
Minimalny tonaż i warunki dostawy po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V[m-1] | | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-----------------|------------------------------------|------|---------------------|------|---|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiatka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | |
| UBP 356 x 368 x 174 | 174 | 51350 | 2841 | 3208 | 15,1 | 80,81 | 18460 | 975,7 | 1499 | 9,0 | 8,4 | 344,9 | 5359 | 2 | 3 | 2 | 3 | 80 | 97 | 49 | 66 |
| UBP 356 x 368 x 152 | 152 | 44310 | 2486 | 2789 | 15,0 | 70,84 | 15880 | 844,6 | 1295 | 9,0 | 7,7 | 234,8 | 4542 | 3 | 3 | 3 | 3 | 91 | 110 | 56 | 75 |
| UBP 356 x 368 x 133 | 133 | 38320 | 2177 | 2427 | 14,9 | 62,17 | 13680 | 732,0 | 1120 | 8,9 | 7,0 | 160,2 | 3864 | 3 | 4 | 3 | 4 | 103 | 125 | 63 | 85 |
| UBP 356 x 368 x 109 | 109 | 30970 | 1788 | 1978 | 14,8 | 51,28 | 10980 | 592,4 | 904,6 | 8,8 | 6,2 | 91,19 | 3052 | 4 | 4 | 4 | 4 | 125 | 151 | 76 | 102 |
| UBP 305 x 305 x 223 | 223 | 52950 | 3134 | 3672 | 13,6 | 108,7 | 17580 | 1079 | 1682 | 7,8 | 11,4 | 977,0 | 4138 | 1 | 1 | 1 | 1 | 55 | 66 | 35 | 46 |
| UBP 305 x 305 x 186 | 186 | 42860 | 2611 | 3022 | 13,4 | 90,86 | 14140 | 881,7 | 1369 | 7,7 | 10,0 | 583,3 | 3229 | 1 | 1 | 1 | 1 | 64 | 78 | 41 | 54 |
| UBP 305 x 305 x 149 | 149 | 33320 | 2092 | 2389 | 13,1 | 73,06 | 10910 | 690,7 | 1067 | 7,5 | 8,5 | 310,3 | 2413 | 1 | 1 | 1 | 1 | 79 | 95 | 50 | 66 |
| UBP 305 x 305 x 126 | 126 | 27660 | 1771 | 2004 | 13,0 | 62,04 | 9005 | 575,5 | 887,3 | 7,4 | 7,6 | 192,8 | 1951 | 1 | 3 | 1 | 3 | 92 | 111 | 58 | 77 |
| UBP 305 x 305 x 110 | 110 | 23810 | 1547 | 1739 | 12,9 | 54,34 | 7712 | 496,4 | 763,6 | 7,3 | 6,9 | 131,0 | 1646 | 3 | 3 | 3 | 3 | 105 | 127 | 65 | 87 |
| UBP 305 x 305 x 95 | 94,9 | 20300 | 1336 | 1493 | 12,8 | 47,37 | 6531 | 423,1 | 649,7 | 7,3 | 6,3 | 86,88 | 1374 | 3 | 3 | 3 | 3 | 120 | 146 | 75 | 100 |
| UBP 305 x 305 x 88 | 88,0 | 18680 | 1238 | 1379 | 12,8 | 44,23 | 5986 | 389,0 | 596,9 | 7,2 | 6,0 | 70,29 | 1251 | 3 | 4 | 3 | 4 | 129 | 156 | 80 | 107 |
| UBP 305 x 305 x 79 | 78,9 | 16690 | 1115 | 1237 | 12,7 | 39,57 | 5328 | 347,8 | 532,8 | 7,2 | 5,6 | 52,15 | 1105 | 4 | 4 | 4 | 4 | 143 | 173 | 89 | 119 |
| UBP 254 x 254 x 85 | 85,1 | 12290 | 966,7 | 1093 | 10,6 | 39,72 | 4215 | 323,7 | 497,9 | 6,2 | 5,8 | 82,17 | 605,9 | 2 | 3 | 2 | 3 | 114 | 138 | 71 | 95 |
| UBP 254 x 254 x 71 | 71,0 | 10070 | 807,2 | 904,6 | 10,5 | 33,09 | 3439 | 266,6 | 408,8 | 6,1 | 5,1 | 48,64 | 485,1 | 3 | 3 | 3 | 3 | 136 | 164 | 84 | 112 |
| UBP 254 x 254 x 63 | 63,0 | 8868 | 717,7 | 800,0 | 10,5 | 29,29 | 3016 | 235,0 | 359,7 | 6,1 | 4,7 | 34,48 | 420,9 | 3 | 4 | 3 | 4 | 152 | 184 | 94 | 125 |
| UBP 203 x 203 x 54 | 53,9 | 5024 | 492,5 | 556,3 | 8,5 | 24,90 | 1705 | 164,1 | 252,3 | 4,9 | 4,5 | 32,56 | 157,8 | 2 | 3 | 2 | 3 | 144 | 174 | 90 | 120 |
| UBP 203 x 203 x 45 | 44,9 | 4097 | 409,3 | 458,5 | 8,4 | 20,87 | 1383 | 134,4 | 206,0 | 4,9 | 4,0 | 19,15 | 125,6 | 3 | 3 | 3 | 3 | 172 | 208 | 106 | 142 |

Universal beams

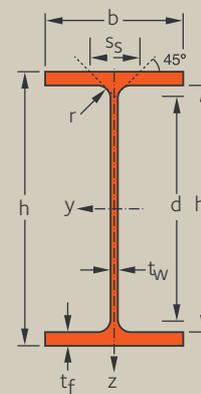
Dimensions: EN 10365:2017
Tolerances: EN 10034:1993
Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas universales

Dimensiones: EN 10365:2017
Tolerancias: EN 10034:1993
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki uniwersalne

Wymiary: EN 10365:2017
Tolerancje: EN 10034:1993
Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------------------|----------------------|---------|----------------------|---------------------------------------|----------------------|-------------------------------------|---|-------------|---|----|-------------|-----------------|-------------|------|----|-------------|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | r mm | h ₁ mm | d mm | A cm ² | A _L m ² /m | A _c m ² /t | S355 | | | S460 | | | S500 | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|-----|--------|-------|------|------|----|--------|-------|-------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| UB 1100 x 400 x 607 | 607 | 1138,0 | 410,0 | 31,0 | 55,0 | 30 | 1028,0 | 968,0 | 777,4 | 3,802 | 6,230 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 1100 x 400 x 548 | 548 | 1128,0 | 407,0 | 28,0 | 50,0 | 30 | 1028,0 | 968,0 | 702,5 | 3,776 | 6,847 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 1100 x 400 x 499 | 499 | 1118,0 | 405,0 | 26,0 | 45,0 | 30 | 1028,0 | 968,0 | 639,5 | 3,752 | 7,474 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 1100 x 400 x 433 | 433 | 1108,0 | 402,0 | 22,0 | 40,0 | 30 | 1028,0 | 968,0 | 555,4 | 3,728 | 8,549 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| UB 1100 x 400 x 390 | 390 | 1100,0 | 400,0 | 20,0 | 36,0 | 30 | 1028,0 | 968,0 | 501,3 | 3,708 | 9,422 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| UB 1100 x 400 x 343 | 343 | 1090,0 | 400,0 | 18,0 | 31,0 | 30 | 1028,0 | 968,0 | 440,7 | 3,692 | 10,67 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|-----|--------|-------|------|------|----|-------|-------|-------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| UB 1016 x 305 x 584 | 584 | 1056,0 | 314,0 | 36,0 | 64,0 | 30 | 928,0 | 868,0 | 743,7 | 3,244 | 5,556 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 1016 x 305 x 494 | 494 | 1036,0 | 309,0 | 31,0 | 54,0 | 30 | 928,0 | 868,0 | 629,1 | 3,194 | 6,467 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 1016 x 305 x 438 | 438 | 1026,0 | 305,0 | 26,9 | 49,0 | 30 | 928,0 | 868,0 | 556,3 | 3,167 | 7,253 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 1016 x 305 x 415 | 415 | 1020,0 | 304,0 | 26,0 | 46,0 | 30 | 928,0 | 868,0 | 528,7 | 3,152 | 7,595 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 1016 x 305 x 393 | 393 | 1016,0 | 303,0 | 24,4 | 43,9 | 30 | 928,0 | 868,0 | 500,2 | 3,144 | 8,006 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 1016 x 305 x 350 | 350 | 1008,0 | 302,0 | 21,1 | 40,0 | 30 | 928,0 | 868,0 | 445,1 | 3,130 | 8,957 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 1016 x 305 x 314 | 314 | 1000,0 | 300,0 | 19,1 | 35,9 | 30 | 928,0 | 868,0 | 400,4 | 3,110 | 9,894 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 1016 x 305 x 272 | 272 | 990,0 | 300,0 | 16,5 | 31,0 | 30 | 928,0 | 868,0 | 346,8 | 3,095 | 11,37 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 1016 x 305 x 249 | 249 | 980,0 | 300,0 | 16,5 | 26,0 | 30 | 928,0 | 868,0 | 316,8 | 3,075 | 12,36 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 1016 x 305 x 222 | 222 | 970,0 | 300,0 | 16,0 | 21,1 | 30 | 928,0 | 868,0 | 282,8 | 3,056 | 13,77 | ✓ | ✓ | - | ✓ | ✓ | - | - | - | - | - | - | - |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|-----|--------|-------|------|------|----|-------|-------|--------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| UB 1000 x 400 x 976 | 976 | 1108,0 | 428,0 | 50,0 | 89,9 | 30 | 928,0 | 868,0 | 1243,0 | 3,776 | 3,875 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 1000 x 400 x 883 | 883 | 1092,0 | 424,0 | 45,5 | 82,0 | 30 | 928,0 | 868,0 | 1125,0 | 3,737 | 4,230 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 1000 x 400 x 748 | 748 | 1068,0 | 417,0 | 39,0 | 70,0 | 30 | 928,0 | 868,0 | 953,4 | 3,674 | 4,909 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 1000 x 400 x 642 | 642 | 1048,0 | 412,0 | 34,0 | 60,0 | 30 | 928,0 | 868,0 | 817,6 | 3,624 | 5,646 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 1000 x 400 x 591 | 591 | 1040,0 | 409,0 | 31,0 | 55,9 | 30 | 928,0 | 868,0 | 752,7 | 3,602 | 6,096 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 1000 x 400 x 554 | 554 | 1032,0 | 408,0 | 29,5 | 52,0 | 30 | 928,0 | 868,0 | 705,8 | 3,585 | 6,470 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 1000 x 400 x 539 | 539 | 1030,0 | 407,0 | 28,4 | 51,1 | 30 | 928,0 | 868,0 | 687,2 | 3,580 | 6,637 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 1000 x 400 x 483 | 483 | 1020,0 | 404,0 | 25,4 | 46,0 | 30 | 928,0 | 868,0 | 615,1 | 3,554 | 7,360 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 1000 x 400 x 443 | 443 | 1012,0 | 402,0 | 23,6 | 41,9 | 30 | 928,0 | 868,0 | 563,7 | 3,533 | 7,985 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 1000 x 400 x 412 | 412 | 1008,0 | 402,0 | 21,1 | 40,0 | 30 | 928,0 | 868,0 | 525,1 | 3,530 | 8,563 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 1000 x 400 x 371 | 371 | 1000,0 | 400,0 | 19,0 | 36,1 | 30 | 928,0 | 868,0 | 472,8 | 3,510 | 9,457 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 1000 x 400 x 321 | 321 | 990,0 | 400,0 | 16,5 | 31,0 | 30 | 928,0 | 868,0 | 408,8 | 3,495 | 10,89 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 1000 x 400 x 296 | 296 | 982,0 | 400,0 | 16,5 | 27,1 | 30 | 928,0 | 868,0 | 377,6 | 3,479 | 11,74 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|------|--------|-------|------|-------|----|-------|-------|--------|-------|-------|---|----|----|---|---|---|----|----|---|---|---|---|
| UB 920 x 420 x 1377 | 1377 | 1093,0 | 473,0 | 76,7 | 115,1 | 25 | 862,8 | 812,8 | 1753,7 | 3,882 | 2,816 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 920 x 420 x 1269 | 1269 | 1093,0 | 461,0 | 64,0 | 115,1 | 25 | 862,8 | 812,8 | 1616,5 | 3,859 | 3,037 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 920 x 420 x 1194 | 1194 | 1081,0 | 457,0 | 60,5 | 109,0 | 25 | 862,8 | 812,8 | 1521,5 | 3,826 | 3,199 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 920 x 420 x 1077 | 1077 | 1061,0 | 451,0 | 55,0 | 99,1 | 25 | 862,8 | 812,8 | 1371,5 | 3,773 | 3,499 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 920 x 420 x 970 | 970 | 1043,0 | 446,0 | 50,0 | 89,9 | 25 | 862,8 | 812,8 | 1236,6 | 3,727 | 3,832 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |

HI = HISTAR®

40 Minimum order: 40t per section and grade or upon agreement.
♦ Dimensions ArcelorMittal standard

40 Pedido mínimo: 40t por sección y grado o previo acuerdo
♦ Dimensiones estándar de ArcelorMittal

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.
♦ Standardowe wymiary ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazy na symboly na stranach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskazniki przekroju A_p/V [m ⁻¹] | | | | | | |
|---|---|--------------------------|------------------------------|------------------------------|-------------|-----------------------------|---|------------------------------|------------------------------|-------------|-------------|--------------------------|--------------------------|--------------------------------------|---------------------|-----------|-----------------------|--|----------------------|----------------------|----|----------------------|--|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | | Pure Bending y-y | Pure Compression | | Contour encasement | | Hollow encasement | | | | | |
| | G kg/m | I_y cm ⁴ | W_{ely} cm ³ | W_{ply} cm ³ | i_y cm | A_{vz} cm ² | I_z cm ⁴ | W_{elz} cm ³ | W_{plz} cm ³ | i_z cm | S_s cm | I_t cm ⁴ | I_w cm ⁶ | S_{355} | S_{460} | S_{355} | S_{460} | 3 faces/sides/Seiten | | 4 faces/sides/Seiten | | 3 faces/sides/Seiten | | 4 faces/sides/Seiten |
| UB 1100 x 400 x 607 | 607 | 1624100 | 28540 | 33000 | 45,7 | 376,4 | 63470 | 3096 | 4886 | 9,0 | 17,6 | 5789 | 185250 | 1 | 1 | 3 | 4 | 44 | 49 | 35 | 40 | | | |
| UB 1100 x 400 x 548 | 548 | 1456640 | 25820 | 29720 | 45,5 | 339,5 | 56400 | 2771 | 4358 | 8,9 | 16,3 | 4344 | 163220 | 1 | 1 | 4 | 4 | 48 | 54 | 38 | 44 | | | |
| UB 1100 x 400 x 499 | 499 | 1305020 | 23340 | 26810 | 45,1 | 313,7 | 50000 | 2469 | 3879 | 8,8 | 15,1 | 3253 | 143400 | 1 | 1 | 4 | 4 | 52 | 59 | 41 | 48 | | | |
| UB 1100 x 400 x 433 | 433 | 1136540 | 20510 | 23370 | 45,2 | 266,6 | 43420 | 2160 | 3370 | 8,8 | 13,7 | 2229 | 123500 | 1 | 1 | 4 | 4 | 60 | 67 | 47 | 54 | | | |
| UB 1100 x 400 x 390 | 390 | 1016360 | 18470 | 20990 | 45,0 | 242,1 | 38490 | 1924 | 2995 | 8,7 | 12,7 | 1649 | 108680 | 1 | 1 | 4 | 4 | 66 | 74 | 52 | 60 | | | |
| UB 1100 x 400 x 343 | 343 | 878350 | 16110 | 18270 | 44,6 | 216,9 | 33130 | 1656 | 2575 | 8,6 | 11,5 | 1104 | 92700 | 1 | 2 | 4 | 4 | 75 | 84 | 59 | 68 | | | |
| UB 1016 x 305 x 584 | 584 | 1246070 | 23590 | 28030 | 40,9 | 403,2 | 33430 | 2129 | 3474 | 6,7 | 19,9 | 7153 | 81240 | 1 | 1 | 1 | 2 | 39 | 44 | 33 | 37 | | | |
| UB 1016 x 305 x 494 | 494 | 1027950 | 19840 | 23410 | 40,4 | 344,5 | 26820 | 1736 | 2818 | 6,5 | 17,4 | 4395 | 64010 | 1 | 1 | 2 | 3 | 46 | 51 | 38 | 43 | | | |
| UB 1016 x 305 x 438 | 438 | 909170 | 17720 | 20740 | 40,4 | 299,9 | 23350 | 1531 | 2462 | 6,4 | 16,0 | 3181 | 55290 | 1 | 1 | 3 | 4 | 51 | 57 | 42 | 48 | | | |
| UB 1016 x 305 x 415 | 415 | 853120 | 16720 | 19570 | 40,1 | 288,5 | 21700 | 1428 | 2297 | 6,4 | 15,3 | 2703 | 51080 | 1 | 1 | 3 | 4 | 54 | 60 | 44 | 50 | | | |
| UB 1016 x 305 x 393 | 393 | 807680 | 15890 | 18530 | 40,1 | 271,2 | 20490 | 1352 | 2167 | 6,4 | 14,7 | 2329 | 48080 | 1 | 1 | 4 | 4 | 57 | 63 | 47 | 53 | | | |
| UB 1016 x 305 x 350 | 350 | 722960 | 14340 | 16580 | 40,3 | 235,9 | 18460 | 1222 | 1940 | 6,4 | 13,6 | 1718 | 43010 | 1 | 1 | 4 | 4 | 64 | 70 | 52 | 59 | | | |
| UB 1016 x 305 x 314 | 314 | 644210 | 12880 | 14850 | 40,1 | 213,4 | 16230 | 1082 | 1712 | 6,3 | 12,6 | 1263 | 37530 | 1 | 1 | 4 | 4 | 70 | 78 | 57 | 65 | | | |
| UB 1016 x 305 x 272 | 272 | 553840 | 11180 | 12820 | 39,9 | 184,5 | 14000 | 933,6 | 1469 | 6,3 | 11,3 | 834,8 | 32070 | 1 | 2 | 4 | 4 | 81 | 89 | 66 | 74 | | | |
| UB 1016 x 305 x 249 | 249 | 481070 | 9817 | 11340 | 38,9 | 180,7 | 11750 | 783,6 | 1244 | 6,0 | 10,3 | 581,9 | 26620 | 1 | 2 | 4 | 4 | 88 | 97 | 71 | 81 | | | |
| UB 1016 x 305 x 222 | 222 | 407660 | 8405 | 9803 | 37,9 | 172,2 | 9545 | 636,3 | 1020 | 5,8 | 9,3 | 390,0 | 21370 | 1 | - | 4 | - | 97 | 108 | 79 | 90 | | | |
| UB 1000 x 400 x 976 | 976 | 2348680 | 42390 | 50290 | 43,4 | 570,7 | 118520 | 5538 | 8838 | 9,7 | 26,4 | 24410 | 304410 | 1 | 1 | 1 | 1 | 27 | 30 | 21 | 25 | | | |
| UB 1000 x 400 x 883 | 883 | 2096410 | 38390 | 45260 | 43,1 | 516,4 | 104970 | 4951 | 7873 | 9,6 | 24,4 | 18510 | 265670 | 1 | 1 | 1 | 1 | 29 | 33 | 23 | 27 | | | |
| UB 1000 x 400 x 748 | 748 | 1731940 | 32430 | 37880 | 42,6 | 438,9 | 85110 | 4082 | 6459 | 9,4 | 21,4 | 11550 | 210640 | 1 | 1 | 1 | 1 | 34 | 39 | 27 | 31 | | | |
| UB 1000 x 400 x 642 | 642 | 1450580 | 27680 | 32090 | 42,1 | 379,6 | 70280 | 3411 | 5378 | 9,2 | 18,9 | 7381 | 170660 | 1 | 1 | 1 | 2 | 39 | 44 | 31 | 36 | | | |
| UB 1000 x 400 x 591 | 591 | 1331030 | 25590 | 29520 | 42,0 | 346,3 | 64010 | 3130 | 4915 | 9,2 | 17,7 | 5895 | 154320 | 1 | 1 | 2 | 3 | 42 | 48 | 33 | 38 | | | |
| UB 1000 x 400 x 554 | 554 | 1232370 | 23880 | 27490 | 41,7 | 328 | 59090 | 2896 | 4546 | 9,1 | 16,8 | 4834 | 141320 | 1 | 1 | 2 | 3 | 45 | 51 | 35 | 41 | | | |
| UB 1000 x 400 x 539 | 539 | 1202530 | 23350 | 26820 | 41,8 | 316,3 | 57630 | 2832 | 4435 | 9,1 | 16,5 | 4529 | 137550 | 1 | 1 | 2 | 4 | 46 | 52 | 36 | 42 | | | |
| UB 1000 x 400 x 483 | 483 | 1067480 | 20930 | 23920 | 41,6 | 282,7 | 50710 | 2510 | 3918 | 9,0 | 15,2 | 3306 | 119890 | 1 | 1 | 4 | 4 | 51 | 58 | 40 | 46 | | | |
| UB 1000 x 400 x 443 | 443 | 966510 | 19100 | 21770 | 41,4 | 261,8 | 45490 | 2263 | 3529 | 8,9 | 14,2 | 2543 | 106730 | 1 | 1 | 4 | 4 | 56 | 63 | 43 | 50 | | | |
| UB 1000 x 400 x 412 | 412 | 910470 | 18060 | 20460 | 41,6 | 235,9 | 43400 | 2159 | 3348 | 9,0 | 13,6 | 2144 | 101450 | 1 | 1 | 4 | 4 | 60 | 67 | 46 | 54 | | | |
| UB 1000 x 400 x 371 | 371 | 813730 | 16270 | 18360 | 41,4 | 212,5 | 38580 | 1929 | 2984 | 9,0 | 12,6 | 1588 | 89440 | 1 | 1 | 4 | 4 | 66 | 74 | 51 | 59 | | | |
| UB 1000 x 400 x 321 | 321 | 696440 | 14060 | 15790 | 41,2 | 184,5 | 33120 | 1656 | 2554 | 9,0 | 11,3 | 1033 | 76020 | 1 | 2 | 4 | 4 | 76 | 85 | 58 | 68 | | | |
| UB 1000 x 400 x 296 | 296 | 620310 | 12630 | 14250 | 40,5 | 181,5 | 28960 | 1448 | 2242 | 8,7 | 10,5 | 763,6 | 65890 | 1 | 2 | 4 | 4 | 82 | 92 | 63 | 73 | | | |
| UB 920 x 420 x 1377 | 1377 | 3035400 | 55540 | 67740 | 41,5 | 812,9 | 206350 | 8725 | 14160 | 10,8 | 33,6 | 60450 | 485320 | 1 | 1 | 1 | 1 | 19 | 22 | 15 | 18 | | | |
| UB 920 x 420 x 1269 | 1269 | 2901080 | 53080 | 64020 | 42,3 | 688,7 | 189900 | 8238 | 13130 | 10,8 | 32,3 | 52120 | 449320 | 1 | 1 | 1 | 1 | 21 | 24 | 16 | 19 | | | |
| UB 920 x 420 x 1194 | 1194 | 2696760 | 49890 | 59910 | 42,0 | 647,9 | 175050 | 7660 | 12190 | 10,7 | 30,7 | 44110 | 409540 | 1 | 1 | 1 | 1 | 22 | 25 | 17 | 20 | | | |
| UB 920 x 420 x 1077 | 1077 | 2379090 | 44840 | 53450 | 41,6 | 583,9 | 152760 | 6774 | 10740 | 10,5 | 28,2 | 33050 | 350470 | 1 | 1 | 1 | 1 | 24 | 28 | 19 | 22 | | | |
| UB 920 x 420 x 970 | 970 | 2104260 | 40350 | 47750 | 41,2 | 526,8 | 133870 | 6003 | 9497 | 10,3 | 25,9 | 24680 | 301870 | 1 | 1 | 1 | 1 | 27 | 30 | 20 | 24 | | | |

Universal beams (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas universales (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

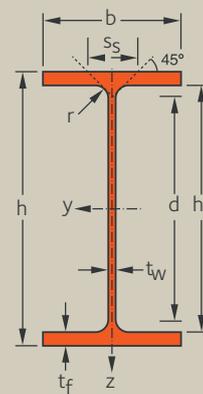
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki uniwersalne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------------------|----------------------|---------|----------------------|---------------------------------------|----------------------|-------------------------------------|---|-------------|---|----|-------------|-------------|-------------|---|----|-------------|----------|------|----|---|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | r mm | h ₁ mm | d mm | A cm ² | A _L m ² /m | A _c m ² /t | S355 | | | | S460 | | | | S500 | | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W | MO/MLO/ML10 | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W | MLO/ML10 | J0/M | ML | |
| UB 920 x 420 x 787 | 40 | 787 | 1011,0 | 437,0 | 40,9 | 73,9 | 25 | 862,8 | 812,8 | 1002,0 | 3,645 | 4,623 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UB 920 x 420 x 725 | 40 | 725 | 999,0 | 434,0 | 38,1 | 68,1 | 25 | 862,8 | 812,8 | 922,9 | 3,615 | 4,977 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 920 x 420 x 656 | 40 | 656 | 987,0 | 431,0 | 34,5 | 62,0 | 25 | 862,8 | 812,8 | 835,3 | 3,586 | 5,454 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 920 x 420 x 588 | 40 | 588 | 975,0 | 427,0 | 31,0 | 55,9 | 25 | 862,8 | 812,8 | 748,1 | 3,553 | 6,032 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 920 x 420 x 537 | 40 | 537 | 965,0 | 425,0 | 28,4 | 51,1 | 25 | 862,8 | 812,8 | 682,5 | 3,530 | 6,567 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 920 x 420 x 491 | 40 | 491 | 957,0 | 422,0 | 25,9 | 47,0 | 25 | 862,8 | 812,8 | 623,3 | 3,507 | 7,142 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 920 x 420 x 449 | 40 | 449 | 948,0 | 423,0 | 24,0 | 42,7 | 25 | 862,8 | 812,8 | 571,4 | 3,497 | 7,766 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - |
| UB 920 x 420 x 420 | 40 | 420 | 943,0 | 422,0 | 22,5 | 39,9 | 25 | 862,8 | 812,8 | 534,1 | 3,486 | 8,28 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 920 x 420 x 390 | 40 | 390 | 936,0 | 420,0 | 21,3 | 36,6 | 25 | 862,8 | 812,8 | 494,3 | 3,466 | 8,891 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 920 x 420 x 368 | 40 | 368 | 931,0 | 419,0 | 20,3 | 34,3 | 25 | 862,8 | 812,8 | 465,6 | 3,454 | 9,404 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 920 x 420 x 344 | 40 | 344 | 927,0 | 418,0 | 19,3 | 32,0 | 25 | 862,8 | 812,8 | 437,2 | 3,444 | 9,984 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 914 x 305 x 576 | ☎ | 576 | 993,0 | 322,0 | 36,1 | 65,0 | 20 | 862,8 | 822,8 | 733,2 | 3,167 | 5,5 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 914 x 305 x 521 | ☎ | 521 | 981,0 | 319,0 | 33,0 | 58,9 | 20 | 862,8 | 822,8 | 663,7 | 3,138 | 6,02 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 914 x 305 x 474 | ☎ | 474 | 971,0 | 316,0 | 30,0 | 54,1 | 20 | 862,8 | 822,8 | 603,9 | 3,112 | 6,561 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 914 x 305 x 425 | ☎ | 425 | 961,0 | 313,0 | 26,9 | 49,0 | 20 | 862,8 | 822,8 | 542,0 | 3,086 | 7,249 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 914 x 305 x 381 | ☎ | 381 | 951,0 | 310,0 | 24,4 | 43,9 | 20 | 862,8 | 822,8 | 485,9 | 3,059 | 8,014 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 914 x 305 x 345 | ☎ | 345 | 943,0 | 308,0 | 22,1 | 39,9 | 20 | 862,8 | 822,8 | 439,7 | 3,039 | 8,799 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 914 x 305 x 313 | ☎ | 313 | 932,0 | 309,0 | 21,1 | 34,5 | 20 | 862,8 | 822,8 | 398,4 | 3,023 | 9,658 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 914 x 305 x 289 | ☎ | 289 | 926,6 | 307,7 | 19,5 | 32,0 | 20 | 862,8 | 822,8 | 368,3 | 3,011 | 10,41 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 914 x 305 x 271 | ☎ | 271 | 923,0 | 307,0 | 18,4 | 30,0 | 20 | 862,8 | 822,8 | 346,1 | 3,003 | 11,04 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 914 x 305 x 253 | ☎ | 253 | 918,4 | 305,5 | 17,3 | 27,9 | 20 | 862,8 | 822,8 | 322,8 | 2,990 | 11,79 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 914 x 305 x 238 | ☎ | 238 | 915,0 | 305,0 | 16,5 | 25,9 | 20 | 862,8 | 822,8 | 303,5 | 2,983 | 12,51 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 914 x 305 x 224 | ☎ | 224 | 910,4 | 304,1 | 15,9 | 23,9 | 20 | 862,8 | 822,8 | 285,6 | 2,971 | 13,24 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 914 x 305 x 201 | ☎ | 201 | 903,0 | 303,3 | 15,1 | 20,2 | 20 | 862,8 | 822,8 | 255,9 | 2,955 | 14,69 | ✓ | ✓ | - | ✓ | ✓ | - | - | - | - | - | - | - |
| UB 840 x 400 x 576 | ☎ | 576 | 913,0 | 411,0 | 32,0 | 57,9 | 20 | 797,1 | 757,1 | 735,0 | 3,372 | 5,848 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 840 x 400 x 527 | ☎ | 527 | 903,0 | 409,0 | 29,5 | 53,1 | 20 | 797,1 | 757,1 | 672,0 | 3,349 | 6,341 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 840 x 400 x 473 | ☎ | 473 | 893,0 | 406,0 | 26,4 | 48,0 | 20 | 797,1 | 757,1 | 603,0 | 3,323 | 7,013 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 840 x 400 x 433 | ☎ | 433 | 885,0 | 404,0 | 24,4 | 43,9 | 20 | 797,1 | 757,1 | 552,0 | 3,303 | 7,613 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | ✓ |
| UB 840 x 400 x 392 | ☎ | 392 | 877,0 | 401,0 | 22,1 | 39,9 | 20 | 797,1 | 757,1 | 499,0 | 3,279 | 8,361 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 840 x 400 x 359 | ☎ | 359 | 868,0 | 403,0 | 21,1 | 35,6 | 20 | 797,1 | 757,1 | 457,0 | 3,271 | 9,088 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 840 x 400 x 329 | ☎ | 329 | 862,0 | 401,0 | 19,7 | 32,4 | 20 | 797,1 | 757,1 | 419,0 | 3,254 | 9,862 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 840 x 400 x 299 | ☎ | 299 | 856,0 | 400,0 | 18,2 | 29,2 | 20 | 797,1 | 757,1 | 381,0 | 3,241 | 10,80 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |

HI = HISTAR®

☐ Minimum order: 40t per section and grade or upon agreement.
☎ Minimum tonnage and delivery conditions upon agreement.
◆ Dimensions ArcelorMittal standard

☐ Pedido mínimo: 40t por sección y grado o previo acuerdo.
☎ Plazo mínimo y condiciones de entrega previo acuerdo.
◆ Dimensiones estándar de ArcelorMittal

☐ Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
☎ Minimalny tonaż i warunki dostawy po uzgodnieniu.
◆ Wymiary standard ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V(m-1) | | | |
|---|---|---|-------------------------------------|-------------------------------------|----------------------|------------------------------------|---|-------------------------------------|-------------------------------------|----------------------|----------------------|----------------------|-----------------------------------|---|-----------------------------------|---|-----------------------|---|------|------|----------------------|
| | G kg/m | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | S _s cm | I _t cm ⁴ | I _w cm ⁶ x10 ³ | Pure Bending y-y | Pure Compression | Contour encasement | Hollow encasement | | | |
| | | I _y cm ⁴ | W _{ely} cm ³ | W _{ply} cm ³ | i _y cm | A _{vz} cm ² | I _z cm ⁴ | W _{elz} cm ³ | W _{plz} cm ³ | i _z cm | S _s cm | | | | I _t cm ⁴ | I _w cm ⁶ x10 ³ | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten |
| UB 920 x 420 x 787 | 787 | 1649860 | 32630 | 38110 | 40,5 | 425,5 | 103310 | 4728 | 7431 | 10,1 | 21,7 | 13650 | 225650 | 1 | 1 | 1 | 1 | 32 | 36 | 24 | 29 |
| UB 920 x 420 x 725 | 725 | 1496530 | 29960 | 34830 | 40,2 | 394,0 | 93210 | 4295 | 6739 | 10 | 20,3 | 10750 | 201000 | 1 | 1 | 1 | 1 | 34 | 39 | 26 | 31 |
| UB 920 x 420 x 656 | 656 | 1339430 | 27140 | 31360 | 39,9 | 355,4 | 83050 | 3854 | 6027 | 9,9 | 18,7 | 8098 | 176960 | 1 | 1 | 1 | 1 | 38 | 43 | 29 | 34 |
| UB 920 x 420 x 588 | 588 | 1185310 | 24310 | 27940 | 39,7 | 318,2 | 72770 | 3408 | 5314 | 9,8 | 17,2 | 5923 | 153180 | 1 | 1 | 1 | 2 | 42 | 47 | 32 | 37 |
| UB 920 x 420 x 537 | 537 | 1069610 | 22160 | 25360 | 39,5 | 290,4 | 65560 | 3085 | 4799 | 9,7 | 15,9 | 4542 | 136510 | 1 | 1 | 2 | 3 | 45 | 52 | 34 | 41 |
| UB 920 x 420 x 491 | 491 | 970410 | 20280 | 23090 | 39,3 | 264,5 | 59010 | 2796 | 4339 | 9,7 | 14,9 | 3520 | 121870 | 1 | 1 | 3 | 4 | 49 | 56 | 37 | 44 |
| UB 920 x 420 x 449 | 449 | 878790 | 18540 | 21040 | 39,1 | 243,9 | 53980 | 2552 | 3953 | 9,7 | 13,8 | 2692 | 110360 | 1 | 1 | 3 | 4 | 54 | 61 | 40 | 48 |
| UB 920 x 420 x 420 | 420 | 817410 | 17330 | 19620 | 39,0 | 228,5 | 50070 | 2373 | 3671 | 9,6 | 13,1 | 2208 | 101890 | 1 | 1 | 4 | 4 | 57 | 65 | 43 | 51 |
| UB 920 x 420 x 390 | 390 | 745810 | 15930 | 18010 | 38,7 | 215,2 | 45270 | 2156 | 3334 | 9,5 | 12,3 | 1741 | 91390 | 1 | 1 | 4 | 4 | 61 | 70 | 46 | 55 |
| UB 920 x 420 x 368 | 368 | 696290 | 14950 | 16880 | 38,5 | 204,5 | 42120 | 2010 | 3108 | 9,4 | 11,8 | 1452 | 84530 | 1 | 1 | 4 | 4 | 65 | 74 | 49 | 58 |
| UB 920 x 420 x 344 | 344 | 649060 | 14000 | 15790 | 38,4 | 194,1 | 39010 | 1866 | 2884 | 9,4 | 11,2 | 1198 | 78000 | 1 | 1 | 4 | 4 | 69 | 78 | 52 | 61 |
| UB 914 x 305 x 576 | 576 | 1102320 | 22200 | 26290 | 38,7 | 364,4 | 36520 | 2268 | 3658 | 7,0 | 18,9 | 7153 | 77860 | 1 | 1 | 1 | 1 | 39 | 43 | 31 | 36 |
| UB 914 x 305 x 521 | 521 | 983010 | 20040 | 23610 | 38,4 | 331,2 | 32140 | 2015 | 3239 | 6,9 | 17,4 | 5358 | 67730 | 1 | 1 | 1 | 2 | 42 | 47 | 34 | 39 |
| UB 914 x 305 x 474 | 474 | 886280 | 18250 | 21400 | 38,3 | 300,1 | 28650 | 1813 | 2901 | 6,8 | 16,1 | 4118 | 59790 | 1 | 1 | 2 | 3 | 46 | 52 | 37 | 43 |
| UB 914 x 305 x 425 | 425 | 788770 | 16410 | 19140 | 38,1 | 268,3 | 25190 | 1609 | 2562 | 6,8 | 14,8 | 3040 | 52070 | 1 | 1 | 2 | 4 | 51 | 57 | 41 | 47 |
| UB 914 x 305 x 381 | 381 | 697370 | 14660 | 17030 | 37,8 | 242,3 | 21910 | 1413 | 2243 | 6,7 | 13,5 | 2206 | 44830 | 1 | 1 | 3 | 4 | 57 | 63 | 46 | 52 |
| UB 914 x 305 x 345 | 345 | 626190 | 13280 | 15360 | 37,7 | 218,9 | 19510 | 1267 | 2003 | 6,6 | 12,5 | 1656 | 39610 | 1 | 1 | 4 | 4 | 62 | 69 | 50 | 57 |
| UB 914 x 305 x 313 | 313 | 548840 | 11770 | 13640 | 37,1 | 206,6 | 17040 | 1102 | 1748 | 6,5 | 11,3 | 1167 | 34160 | 1 | 1 | 4 | 4 | 68 | 76 | 55 | 62 |
| UB 914 x 305 x 289 | 289 | 504730 | 10890 | 12580 | 37,0 | 190,6 | 15590 | 1013 | 1601 | 6,5 | 10,6 | 931,5 | 31080 | 1 | 1 | 4 | 4 | 73 | 82 | 59 | 67 |
| UB 914 x 305 x 271 | 271 | 472170 | 10230 | 11790 | 36,9 | 179,7 | 14510 | 945,8 | 1491 | 6,4 | 10,1 | 774,3 | 28840 | 1 | 1 | 4 | 4 | 78 | 87 | 62 | 71 |
| UB 914 x 305 x 253 | 253 | 436840 | 9513 | 10950 | 36,7 | 168,6 | 13300 | 870,8 | 1371 | 6,4 | 9,6 | 629,9 | 26280 | 1 | 1 | 4 | 4 | 83 | 93 | 66 | 76 |
| UB 914 x 305 x 238 | 238 | 407010 | 8896 | 10240 | 36,5 | 160,4 | 12280 | 805,6 | 1267 | 6,3 | 9,1 | 518,3 | 24200 | 1 | 1 | 4 | 4 | 88 | 98 | 70 | 80 |
| UB 914 x 305 x 224 | 224 | 376950 | 8281 | 9547 | 36,3 | 153,9 | 11230 | 739,0 | 1163 | 6,2 | 8,7 | 425,5 | 22000 | 1 | 2 | 4 | 4 | 93 | 104 | 74 | 85 |
| UB 914 x 305 x 201 | 201 | 325790 | 7215 | 8364 | 35,6 | 144,8 | 9423 | 621,3 | 982,4 | 6,0 | 7,8 | 293,9 | 18300 | 1 | - | 4 | - | 104 | 116 | 82 | 94 |
| UB 840 x 400 x 576 | 576 | 1011770 | 22160 | 25560 | 37,1 | 300,2 | 67220 | 3271 | 5101 | 9,5 | 17,1 | 6167 | 122460 | 1 | 1 | 1 | 2 | 40 | 46 | 30 | 36 |
| UB 840 x 400 x 527 | 527 | 915080 | 20260 | 23270 | 36,8 | 275,3 | 60730 | 2969 | 4621 | 9,5 | 15,9 | 4777 | 109340 | 1 | 1 | 1 | 2 | 44 | 50 | 33 | 39 |
| UB 840 x 400 x 473 | 473 | 813200 | 18210 | 20790 | 36,7 | 245,7 | 53670 | 2643 | 4100 | 9,4 | 14,5 | 3511 | 95560 | 1 | 1 | 2 | 3 | 48 | 55 | 36 | 43 |
| UB 840 x 400 x 433 | 433 | 736270 | 16630 | 18920 | 36,4 | 226,2 | 48350 | 2393 | 3706 | 9,3 | 13,5 | 2704 | 85320 | 1 | 1 | 3 | 4 | 52 | 60 | 39 | 47 |
| UB 840 x 400 x 392 | 392 | 659650 | 15040 | 17040 | 36,3 | 204,3 | 42960 | 2142 | 3310 | 9,2 | 12,5 | 2026 | 75110 | 1 | 1 | 4 | 4 | 58 | 66 | 43 | 51 |
| UB 840 x 400 x 359 | 359 | 591620 | 13630 | 15420 | 35,9 | 193,3 | 38900 | 1930 | 2984 | 9,2 | 11,5 | 1510 | 67260 | 1 | 1 | 4 | 4 | 63 | 71 | 47 | 55 |
| UB 840 x 400 x 329 | 329 | 535820 | 12430 | 14040 | 35,7 | 179,8 | 34870 | 1739 | 2687 | 9,1 | 10,7 | 1159 | 59910 | 1 | 1 | 4 | 4 | 68 | 77 | 51 | 60 |
| UB 840 x 400 x 299 | 299 | 481680 | 11250 | 12680 | 35,5 | 165,5 | 31190 | 1559 | 2406 | 9,0 | 10,0 | 866,2 | 53220 | 1 | 1 | 4 | 4 | 74 | 85 | 55 | 66 |

Universal beams (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas universales (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

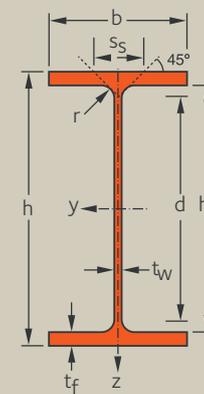
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki uniwersalne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | | | | |
|---|--------------------------------------|-------|----------------|----------------|------|----------------|-------|-----------------|---------------------------------------|-------------------|-------------|---|----|-------------|-----------------|-------------|---|----|-------------|------------|--------|----|----|---|----|---|---|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _C | S355 | | | | S460 | | | | S500 | | | | | | | | |
| | | | | | | | | | | | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | J0W/J2W/K2W | MLO / ML10 | J0 / M | ML | | | | | |
| G | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | | | | | | | | | | | | | | | |
| UB 838 x 292 x 251 ☎ | 251 | 859,0 | 292,0 | 17,0 | 31,0 | 20 | 797,3 | 757,3 | 319,3 | 2,818 | 11,22 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | ✓ | - |
| UB 838 x 292 x 226 ☎ | 226 | 850,9 | 293,8 | 16,1 | 26,8 | 20 | 797,3 | 757,3 | 288,6 | 2,810 | 12,37 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | ✓ | - |
| UB 838 x 292 x 194 ☎ | 194 | 840,7 | 292,4 | 14,7 | 21,7 | 20 | 797,3 | 757,3 | 246,8 | 2,787 | 14,34 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | - | - |
| UB 838 x 292 x 176 ☎ | 176 | 834,9 | 291,7 | 14,0 | 18,8 | 20 | 797,3 | 757,3 | 224,0 | 2,774 | 15,72 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - |
| UB 762 x 267 x 220 ◆ [40] | 220 | 779,0 | 266,0 | 16,5 | 30,0 | 20 | 719,0 | 679,0 | 280,7 | 2,555 | 11,56 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | - | - |
| UB 762 x 267 x 197 | 197 | 769,8 | 268,0 | 15,6 | 25,4 | 20 | 719,0 | 679,0 | 250,6 | 2,546 | 12,88 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | - | - |
| UB 762 x 267 x 173 | 173 | 762,2 | 266,7 | 14,3 | 21,6 | 20 | 719,0 | 679,0 | 220,4 | 2,528 | 14,54 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | - | - |
| UB 762 x 267 x 147 | 147 | 754,0 | 265,2 | 12,8 | 17,5 | 20 | 719,0 | 679,0 | 187,2 | 2,509 | 16,98 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - |
| UB 762 x 267 x 134 | 134 | 750,0 | 264,4 | 12,0 | 15,5 | 20 | 719,0 | 679,0 | 170,6 | 2,499 | 18,54 | ✓ | ✓ | - | ✓ | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - |
| UB 760 x 380 x 582 ◆ ☎ | 582 | 843,0 | 396,0 | 34,5 | 62,0 | 20 | 719,1 | 679,1 | 742,0 | 3,167 | 5,433 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - | ✓ | - | - | ✓ |
| UB 760 x 380 x 531 ◆ ☎ | 531 | 833,0 | 393,0 | 31,5 | 56,9 | 20 | 719,1 | 679,1 | 676,0 | 3,141 | 5,908 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - | ✓ | - | - | ✓ |
| UB 760 x 380 x 484 ◆ ☎ | 484 | 823,0 | 390,0 | 29,0 | 52,1 | 20 | 719,1 | 679,1 | 617,0 | 3,114 | 6,416 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - | ✓ | - | - | ✓ |
| UB 760 x 380 x 434 ◆ ☎ | 434 | 813,0 | 387,0 | 25,9 | 47,0 | 20 | 719,1 | 679,1 | 553,0 | 3,088 | 7,108 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | - | - | ✓ | - | - | ✓ |
| UB 760 x 380 x 389 ◆ ☎ | 389 | 803,0 | 385,0 | 23,6 | 41,9 | 20 | 719,1 | 679,1 | 495,0 | 3,064 | 7,873 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | ✓ | ✓ |
| UB 760 x 380 x 350 ◆ ☎ | 350 | 795,0 | 382,0 | 21,1 | 38,1 | 20 | 719,1 | 679,1 | 445,0 | 3,041 | 8,682 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | ✓ | - |
| UB 760 x 380 x 314 ◆ ☎ | 314 | 786,0 | 384,0 | 19,7 | 33,4 | 20 | 719,1 | 679,1 | 400,0 | 3,034 | 9,623 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | ✓ | - |
| UB 760 x 380 x 284 ◆ ☎ | 284 | 780,0 | 382,0 | 18,0 | 30,1 | 20 | 719,1 | 679,1 | 362,0 | 3,018 | 10,59 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | ✓ | - |
| UB 760 x 380 x 257 ◆ ☎ | 257 | 772,0 | 381,0 | 16,6 | 27,1 | 20 | 719,1 | 679,1 | 328,0 | 3,000 | 11,61 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | HI | ✓ | HI | ✓ | - |
| UB 690 x 360 x 802 ◆ ☎ | 802 | 826,0 | 387,0 | 50,0 | 89,9 | 20 | 645,9 | 605,9 | 1021,0 | 3,066 | 3,820 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UB 690 x 360 x 548 ◆ ☎ | 548 | 772,0 | 372,0 | 35,1 | 63,0 | 20 | 645,9 | 605,9 | 697,4 | 2,927 | 5,335 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UB 690 x 360 x 500 ◆ ☎ | 500 | 762,0 | 369,0 | 32,0 | 57,9 | 20 | 645,9 | 605,9 | 636,0 | 2,902 | 5,799 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UB 690 x 360 x 457 ◆ ☎ | 457 | 752,0 | 367,0 | 29,5 | 53,1 | 20 | 645,9 | 605,9 | 582,2 | 2,879 | 6,283 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UB 690 x 360 x 419 ◆ ☎ | 419 | 744,0 | 364,0 | 26,9 | 49,0 | 20 | 645,9 | 605,9 | 532,4 | 2,856 | 6,814 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UB 690 x 360 x 384 ◆ ☎ | 384 | 736,0 | 362,0 | 24,9 | 45,0 | 20 | 645,9 | 605,9 | 488,6 | 2,836 | 7,372 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UB 690 x 360 x 350 ◆ ☎ | 350 | 728,0 | 360,0 | 23,1 | 40,9 | 20 | 645,9 | 605,9 | 445,7 | 2,815 | 8,019 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UB 690 x 360 x 323 ◆ ☎ | 323 | 722,0 | 359,0 | 21,1 | 38,1 | 20 | 645,9 | 605,9 | 411,8 | 2,803 | 8,640 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| UB 690 x 360 x 289 ◆ ☎ | 289 | 714,0 | 356,0 | 19,0 | 34,0 | 20 | 645,9 | 605,9 | 366,8 | 2,780 | 9,617 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| UB 690 x 360 x 265 ◆ ☎ | 265 | 706,0 | 358,0 | 18,4 | 30,2 | 20 | 645,9 | 605,9 | 337,0 | 2,773 | 10,44 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| UB 690 x 360 x 240 ◆ ☎ | 240 | 701,0 | 356,0 | 16,8 | 27,4 | 20 | 645,9 | 605,9 | 305,6 | 2,758 | 11,44 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| UB 690 x 360 x 217 ◆ ☎ | 217 | 695,0 | 355,0 | 15,4 | 24,8 | 20 | 645,9 | 605,9 | 277,4 | 2,745 | 12,54 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |

HI = HISTAR®

[40] Minimum order: 40t per section and grade or upon agreement.
☎ Minimum tonnage and delivery conditions upon agreement.
◆ Dimensions ArcelorMittal standard

[40] Pedido mínimo: 40t por sección y grado o previo acuerdo
☎ Plazo mínimo y condiciones de entrega previo acuerdo
◆ Dimensiones estándar de ArcelorMittal

[40] Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
☎ Minimalny tonaż i warunki dostawy po uzgodnieniu.
◆ Wymiary standard ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V (m-1) | | | |
|---|---|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|------------------------------------|---|-------------------------------------|-------------------------------------|----------------------|----------------------|-----------------------------------|------------------------|------------------------------------|-----------------------|----------------------|-----------------------------------|--|------|------|------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | Pure Compression | Contour encasement | Hollow encasement | | | | | |
| | G kg/m | I _y cm ⁴ | W _{ely} cm ³ | W _{ply} cm ³ | i _y cm | A _{vz} cm ² | I _z cm ⁴ | W _{elz} cm ³ | W _{plz} cm ³ | i _z cm | S _s cm | I _t cm ⁴ | | | | | I _w cm ⁶ | S355 | S460 | S355 | S460 |
| UB 838 x 292 x 251 | 251 | 387490 | 9021 | 10320 | 34,8 | 156,5 | 12900 | 883,7 | 1383 | 6,3 | 10,2 | 745,5 | 22040 | 1 | 1 | 4 | 4 | 79 | 88 | 63 | 72 |
| UB 838 x 292 x 226 | 226 | 340800 | 8010 | 9182 | 34,3 | 146,8 | 11360 | 773,3 | 1212 | 6,2 | 9,3 | 522,3 | 19230 | 1 | 1 | 4 | 4 | 87 | 97 | 69 | 79 |
| UB 838 x 292 x 194 | 194 | 280270 | 6667 | 7668 | 33,6 | 132,5 | 9067 | 620,2 | 974,7 | 6,0 | 8,1 | 312,2 | 15160 | 1 | 2 | 4 | 4 | 101 | 113 | 80 | 92 |
| UB 838 x 292 x 176 | 176 | 247110 | 5919 | 6835 | 33,1 | 125,2 | 7800 | 534,8 | 842,8 | 5,8 | 7,5 | 226,7 | 12940 | 1 | 2 | 4 | 4 | 110 | 123 | 87 | 100 |
| UB 762 x 267 x 220 | 220 | 279390 | 7173 | 8231 | 31,4 | 139,0 | 9443 | 710 | 1114 | 5,7 | 9,9 | 620,5 | 13190 | 1 | 1 | 4 | 4 | 81 | 91 | 65 | 74 |
| UB 762 x 267 x 197 | 197 | 241320 | 6269 | 7205 | 30,9 | 129,7 | 8177 | 610,2 | 960,1 | 5,6 | 8,9 | 416,5 | 11280 | 1 | 1 | 4 | 4 | 90 | 101 | 72 | 82 |
| UB 762 x 267 x 173 | 173 | 206650 | 5422 | 6236 | 30,5 | 117,9 | 6851 | 513,8 | 808,9 | 5,5 | 8,0 | 276,8 | 9364 | 1 | 1 | 4 | 4 | 102 | 114 | 81 | 93 |
| UB 762 x 267 x 147 | 147 | 169870 | 4505 | 5194 | 30,0 | 104,7 | 5457 | 411,5 | 648,5 | 5,3 | 7,1 | 166,1 | 7377 | 1 | 2 | 4 | 4 | 119 | 133 | 94 | 108 |
| UB 762 x 267 x 134 | 134 | 152060 | 4054 | 4682 | 29,7 | 97,77 | 4789 | 362,2 | 571,2 | 5,2 | 6,6 | 125,0 | 6440 | 1 | 2 | 4 | 4 | 130 | 146 | 103 | 118 |
| UB 760 x 380 x 582 | 582 | 861550 | 20440 | 23750 | 34,0 | 297,6 | 64430 | 3254 | 5082 | 9,3 | 18,1 | 7219 | 97850 | 1 | 1 | 1 | 1 | 37 | 43 | 28 | 33 |
| UB 760 x 380 x 531 | 531 | 776640 | 18640 | 21550 | 33,8 | 270,6 | 57760 | 2939 | 4579 | 9,2 | 16,8 | 5563 | 86670 | 1 | 1 | 1 | 1 | 41 | 46 | 30 | 36 |
| UB 760 x 380 x 484 | 484 | 698760 | 16980 | 19530 | 33,6 | 247,8 | 51660 | 2649 | 4119 | 9,1 | 15,6 | 4279 | 76520 | 1 | 1 | 1 | 1 | 44 | 50 | 33 | 39 |
| UB 760 x 380 x 434 | 434 | 618840 | 15220 | 17400 | 33,4 | 220,6 | 45510 | 2352 | 3646 | 9,0 | 14,3 | 3127 | 66600 | 1 | 1 | 1 | 2 | 49 | 56 | 36 | 43 |
| UB 760 x 380 x 389 | 389 | 545190 | 13570 | 15450 | 33,1 | 199,8 | 39930 | 2074 | 3211 | 8,9 | 13 | 2247 | 57710 | 1 | 1 | 2 | 3 | 54 | 62 | 40 | 48 |
| UB 760 x 380 x 350 | 350 | 486880 | 12240 | 13860 | 33,0 | 178,3 | 35460 | 1856 | 2865 | 8,9 | 12 | 1675 | 50690 | 1 | 1 | 3 | 4 | 60 | 68 | 44 | 53 |
| UB 760 x 380 x 314 | 314 | 428860 | 10910 | 12320 | 32,6 | 165,0 | 31570 | 1644 | 2537 | 8,8 | 10,9 | 1182 | 44630 | 1 | 1 | 4 | 4 | 66 | 76 | 49 | 58 |
| UB 760 x 380 x 284 | 284 | 383750 | 9839 | 11070 | 32,5 | 150,4 | 28000 | 1466 | 2259 | 8,7 | 10,1 | 875,0 | 39310 | 1 | 1 | 4 | 4 | 73 | 83 | 54 | 64 |
| UB 760 x 380 x 257 | 257 | 342050 | 8861 | 9951 | 32,2 | 137,9 | 25010 | 1313 | 2020 | 8,7 | 9,4 | 651,1 | 34650 | 1 | 1 | 4 | 4 | 80 | 91 | 58 | 70 |
| UB 690 x 360 x 802 | 802 | 1063170 | 25740 | 30930 | 32,2 | 407,4 | 87540 | 4524 | 7146 | 9,2 | 25,3 | 20610 | 117630 | 1 | 1 | 1 | 1 | 26 | 30 | 20 | 24 |
| UB 690 x 360 x 548 | 548 | 672930 | 17430 | 20380 | 31,0 | 277,4 | 54300 | 2919 | 4565 | 8,8 | 18,4 | 7065 | 67920 | 1 | 1 | 1 | 1 | 37 | 42 | 27 | 33 |
| UB 690 x 360 x 500 | 500 | 606230 | 15910 | 18490 | 30,8 | 251,9 | 48670 | 2638 | 4114 | 8,7 | 17,1 | 5459 | 60090 | 1 | 1 | 1 | 1 | 40 | 46 | 30 | 35 |
| UB 690 x 360 x 457 | 457 | 546550 | 14530 | 16800 | 30,6 | 230,8 | 43890 | 2392 | 3723 | 8,6 | 15,9 | 4228 | 53420 | 1 | 1 | 1 | 1 | 43 | 49 | 32 | 38 |
| UB 690 x 360 x 419 | 419 | 495390 | 13310 | 15310 | 30,4 | 209,9 | 39500 | 2170 | 3369 | 8,6 | 14,8 | 3299 | 47560 | 1 | 1 | 1 | 1 | 47 | 53 | 35 | 42 |
| UB 690 x 360 x 384 | 384 | 448880 | 12190 | 13960 | 30,2 | 193,4 | 35670 | 1970 | 3054 | 8,5 | 13,8 | 2569 | 42470 | 1 | 1 | 1 | 2 | 50 | 58 | 37 | 45 |
| UB 690 x 360 x 350 | 350 | 403400 | 11080 | 12630 | 30,0 | 178,5 | 31870 | 1771 | 2742 | 8,4 | 12,8 | 1953 | 37530 | 1 | 1 | 1 | 2 | 55 | 63 | 41 | 49 |
| UB 690 x 360 x 323 | 323 | 371040 | 10270 | 11660 | 29,9 | 162,9 | 29430 | 1640 | 2532 | 8,4 | 12 | 1567 | 34350 | 1 | 1 | 2 | 3 | 59 | 68 | 44 | 52 |
| UB 690 x 360 x 289 | 289 | 326240 | 9138 | 10320 | 29,7 | 146,2 | 25610 | 1438 | 2217 | 8,3 | 11 | 1120 | 29550 | 1 | 1 | 3 | 4 | 66 | 75 | 48 | 58 |
| UB 690 x 360 x 265 | 265 | 291790 | 8266 | 9333 | 29,3 | 139,8 | 23130 | 1292 | 1994 | 8,2 | 10,2 | 833,7 | 26360 | 1 | 1 | 3 | 4 | 71 | 82 | 52 | 63 |
| UB 690 x 360 x 240 | 240 | 262680 | 7494 | 8433 | 29,2 | 127,5 | 20630 | 1159 | 1786 | 8,1 | 9,5 | 627,2 | 23370 | 1 | 1 | 4 | 4 | 78 | 90 | 57 | 69 |
| UB 690 x 360 x 217 | 217 | 235790 | 6785 | 7613 | 29,0 | 116,5 | 18510 | 1043 | 1605 | 8,1 | 8,8 | 471,5 | 20760 | 1 | 1 | 4 | 4 | 86 | 98 | 63 | 75 |

Universal beams (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas universales (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

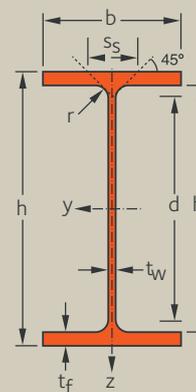
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki uniwersalne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | |
|---|--------------------------------------|-------|-------|----------------|----------------|----|----------------|---------------------------------------|-----------------|-------------------|---|-------------|----|----|-------------|-------------|-------------|----|----|-------------|----------|------|----|
| | G | h | b | t _w | t _f | r | h _i | d | A | A _L | A _C | S355 | | | | S460 | | | | S500 | | | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO/MLO/ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO/ML10 | JO/M | ML |
| UB 686 x 254 x 192 ♦ [40] | 192 | 702,0 | 254,0 | 15,5 | 27,9 | 20 | 645,5 | 605,5 | 243,8 | 2,355 | 12,23 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 686 x 254 x 170 [40] | 170 | 692,9 | 255,8 | 14,5 | 23,7 | 20 | 645,5 | 605,5 | 216,8 | 2,346 | 13,69 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 686 x 254 x 152 [40] | 152 | 687,5 | 254,5 | 13,2 | 21,0 | 20 | 645,5 | 605,5 | 194,1 | 2,332 | 15,19 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 686 x 254 x 140 | 140 | 683,5 | 253,7 | 12,4 | 19,0 | 20 | 645,5 | 605,5 | 178,4 | 2,323 | 16,45 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - |
| UB 686 x 254 x 125 | 125 | 677,9 | 253,0 | 11,7 | 16,2 | 20 | 645,5 | 605,5 | 159,5 | 2,310 | 18,29 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - |
| UB 610 x 325 x 551 ♦ [40] | 551 | 711,0 | 347,0 | 38,6 | 69,1 | 20 | 573,0 | 533,0 | 702,1 | 2,698 | 4,881 | ✓ | HI | HI | - | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 610 x 325 x 498 ♦ [40] | 498 | 699,0 | 343,0 | 35,1 | 63,0 | 20 | 573,0 | 533,0 | 634,8 | 2,665 | 5,332 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 610 x 325 x 455 ♦ [40] | 455 | 689,0 | 340,0 | 32,0 | 57,9 | 20 | 573,0 | 533,0 | 578,6 | 2,640 | 5,793 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 610 x 325 x 415 ♦ [40] | 415 | 679,0 | 338,0 | 29,5 | 53,1 | 20 | 573,0 | 533,0 | 529,4 | 2,617 | 6,274 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 610 x 325 x 372 ♦ [40] | 372 | 669,0 | 335,0 | 26,4 | 48,0 | 20 | 573,0 | 533,0 | 474,3 | 2,591 | 6,930 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 610 x 325 x 341 ♦ [40] | 341 | 661,0 | 333,0 | 24,4 | 43,9 | 20 | 573,0 | 533,0 | 433,7 | 2,571 | 7,518 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UB 610 x 325 x 307 ♦ [40] | 307 | 653,0 | 330,0 | 22,1 | 39,9 | 20 | 573,0 | 533,0 | 391,5 | 2,547 | 8,246 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 325 x 285 ♦ [40] | 285 | 647,0 | 329,0 | 20,6 | 37,1 | 20 | 573,0 | 533,0 | 363,6 | 2,534 | 8,831 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 325 x 262 ♦ [40] | 262 | 641,0 | 327,0 | 19,0 | 34,0 | 20 | 573,0 | 533,0 | 332,7 | 2,518 | 9,585 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 325 x 241 ♦ [40] | 241 | 635,0 | 329,0 | 17,9 | 31,0 | 20 | 573,0 | 533,0 | 308,0 | 2,516 | 10,34 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 325 x 217 ♦ [40] | 217 | 628,0 | 328,0 | 16,5 | 27,7 | 20 | 573,0 | 533,0 | 277,6 | 2,501 | 11,39 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 325 x 195 ♦ [40] | 195 | 622,0 | 327,0 | 15,4 | 24,4 | 20 | 573,0 | 533,0 | 249,3 | 2,487 | 12,61 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 325 x 174 ♦ [40] | 174 | 616,0 | 325,0 | 14,0 | 21,6 | 20 | 573,0 | 533,0 | 222,0 | 2,470 | 14,05 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 325 x 155 ♦ [40] | 155 | 611,0 | 324,0 | 12,7 | 19,0 | 20 | 573,0 | 533,0 | 197,3 | 2,458 | 15,71 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 610 x 305 x 238 ☎ | 238 | 635,8 | 311,4 | 18,4 | 31,4 | 20 | 573,0 | 533,0 | 303,3 | 2,446 | 10,24 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 305 x 179 ☎ | 179 | 620,2 | 307,1 | 14,1 | 23,6 | 20 | 573,0 | 533,0 | 228,1 | 2,406 | 13,37 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UB 610 x 305 x 149 ☎ | 149 | 612,4 | 304,8 | 11,8 | 19,7 | 20 | 573,0 | 533,0 | 190,0 | 2,386 | 15,90 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 610 x 229 x 153 ♦ [40] | 153 | 623,0 | 229,0 | 14,0 | 24,9 | 20 | 573,0 | 533,0 | 195,7 | 2,100 | 13,53 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 610 x 229 x 140 | 140 | 617,2 | 230,2 | 13,1 | 22,1 | 20 | 573,0 | 533,0 | 178,2 | 2,095 | 14,81 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 610 x 229 x 125 | 125 | 612,2 | 229,0 | 11,9 | 19,6 | 20 | 573,0 | 533,0 | 159,3 | 2,082 | 16,43 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | - | - |
| UB 610 x 229 x 113 | 113 | 607,6 | 228,2 | 11,1 | 17,3 | 20 | 573,0 | 533,0 | 143,9 | 2,071 | 18,07 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - |
| UB 610 x 229 x 101 | 101 | 602,6 | 227,6 | 10,5 | 14,8 | 20 | 573,0 | 533,0 | 128,9 | 2,060 | 20,04 | ✓ | ✓ | - | ✓ | ✓ | ✓ | ✓ | - | - | - | - | - |
| UB 610 x 178 x 92 ♦ ☎ | 92,0 | 603,0 | 179,0 | 10,9 | 15,0 | 13 | 573,0 | 547,0 | 117,6 | 1,878 | 20,34 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - |
| UB 610 x 178 x 82 ♦ ☎ | 82,0 | 599,0 | 178,0 | 10,0 | 12,8 | 13 | 573,0 | 547,0 | 104,4 | 1,868 | 22,80 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - |

HI = HISTAR®

[40] Minimum order: 40t per section and grade or upon agreement.
☎ Minimum tonnage and delivery conditions upon agreement.
♦ Dimensions ArcelorMittal standard

[40] Pedido mínimo: 40t por sección y grado o previo acuerdo
☎ Plazo mínimo y condiciones de entrega previo acuerdo
♦ Dimensiones estándar de ArcelorMittal

[40] Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
☎ Minimalny tonaż i warunki dostawy po uzgodnieniu.
♦ Wymiary standard ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V (m ⁻¹) | | | | |
|---|---|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|------------------------------------|---|-------------------------------------|-------------------------------------|----------------------|----------------------|-----------------------------------|------------------------------------|---------------------|------|-----------------------|---|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | Pure Compression | | Contour encasement | Hollow encasement | | | | |
| | G kg/m | I _y cm ⁴ | W _{ely} cm ³ | W _{ply} cm ³ | i _y cm | A _{vz} cm ² | I _z cm ⁴ | W _{elz} cm ³ | W _{plz} cm ³ | i _z cm | S _s cm | I _t cm ⁴ | I _w cm ⁶ | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| UB 686 x 254 x 192 | 192 | 199440 | 5682 | 6504 | 28,5 | 119,0 | 7645 | 602,0 | 943 | 5,5 | 9,4 | 479,7 | 8656 | 1 | 1 | 4 | 4 | 86 | 96 | 68 | 78 |
| UB 686 x 254 x 170 | 170 | 171780 | 4958 | 5676 | 28,0 | 109,9 | 6633 | 518,6 | 813,3 | 5,5 | 8,5 | 321,6 | 7402 | 1 | 1 | 4 | 4 | 96 | 107 | 75 | 87 |
| UB 686 x 254 x 152 | 152 | 151810 | 4416 | 5046 | 27,8 | 99,81 | 5786 | 454,7 | 712,0 | 5,4 | 7,8 | 231,2 | 6407 | 1 | 1 | 4 | 4 | 106 | 119 | 83 | 96 |
| UB 686 x 254 x 140 | 140 | 137720 | 4029 | 4604 | 27,6 | 93,43 | 5185 | 408,7 | 639,9 | 5,3 | 7,3 | 178,7 | 5708 | 1 | 1 | 4 | 4 | 115 | 129 | 90 | 104 |
| UB 686 x 254 x 125 | 125 | 119440 | 3524 | 4040 | 27,2 | 87,33 | 4385 | 346,6 | 544,1 | 5,2 | 6,7 | 124,3 | 4786 | 1 | 2 | 4 | 4 | 128 | 144 | 100 | 116 |
| UB 610 x 325 x 551 | 551 | 559070 | 15720 | 18650 | 28,1 | 278,8 | 48410 | 2790 | 4381 | 8,2 | 20,0 | 8577 | 49560 | 1 | 1 | 1 | 1 | 33 | 38 | 25 | 30 |
| UB 610 x 325 x 498 | 498 | 496220 | 14190 | 16720 | 27,9 | 251,8 | 42590 | 2483 | 3889 | 8,1 | 18,4 | 6477 | 42840 | 1 | 1 | 1 | 1 | 36 | 42 | 27 | 33 |
| UB 610 x 325 x 455 | 455 | 446080 | 12940 | 15140 | 27,7 | 228,5 | 38090 | 2241 | 3500 | 8,0 | 17,1 | 5004 | 37760 | 1 | 1 | 1 | 1 | 40 | 45 | 30 | 35 |
| UB 610 x 325 x 415 | 415 | 401320 | 11820 | 13750 | 27,4 | 209,3 | 34300 | 2030 | 3164 | 8,0 | 15,9 | 3876 | 33460 | 1 | 1 | 1 | 1 | 43 | 49 | 32 | 38 |
| UB 610 x 325 x 372 | 372 | 354790 | 10600 | 12240 | 27,2 | 186,5 | 30170 | 1801 | 2799 | 7,9 | 14,5 | 2850 | 28990 | 1 | 1 | 1 | 1 | 47 | 54 | 35 | 42 |
| UB 610 x 325 x 341 | 341 | 319840 | 9677 | 11120 | 27,0 | 171,5 | 27090 | 1627 | 2525 | 7,8 | 13,5 | 2195 | 25720 | 1 | 1 | 1 | 1 | 51 | 59 | 38 | 46 |
| UB 610 x 325 x 307 | 307 | 285230 | 8736 | 9984 | 26,9 | 154,8 | 23950 | 1452 | 2247 | 7,8 | 12,5 | 1645 | 22450 | 1 | 1 | 1 | 2 | 56 | 65 | 42 | 50 |
| UB 610 x 325 x 285 | 285 | 262280 | 8107 | 9230 | 26,7 | 143,9 | 22060 | 1341 | 2073 | 7,7 | 11,8 | 1328 | 20470 | 1 | 1 | 1 | 2 | 60 | 69 | 44 | 53 |
| UB 610 x 325 x 262 | 262 | 237550 | 7411 | 8405 | 26,6 | 132,3 | 19850 | 1214 | 1874 | 7,7 | 11,0 | 1027 | 18250 | 1 | 1 | 2 | 3 | 65 | 75 | 48 | 58 |
| UB 610 x 325 x 241 | 241 | 216990 | 6834 | 7726 | 26,4 | 123,9 | 18430 | 1120 | 1728 | 7,7 | 10,3 | 802,2 | 16780 | 1 | 1 | 2 | 3 | 71 | 81 | 52 | 62 |
| UB 610 x 325 x 217 | 217 | 192360 | 6126 | 6903 | 26,2 | 113,5 | 16310 | 995,0 | 1533 | 7,6 | 9,5 | 586,1 | 14670 | 1 | 1 | 3 | 4 | 78 | 89 | 57 | 68 |
| UB 610 x 325 x 195 | 195 | 169450 | 5448 | 6129 | 25,9 | 105,2 | 14240 | 871,0 | 1342 | 7,5 | 8,7 | 418,3 | 12690 | 1 | 1 | 4 | 4 | 86 | 99 | 63 | 76 |
| UB 610 x 325 x 174 | 174 | 148720 | 4828 | 5417 | 25,7 | 95,28 | 12370 | 761,6 | 1172 | 7,4 | 8,0 | 297,5 | 10910 | 1 | 1 | 4 | 4 | 96 | 110 | 70 | 84 |
| UB 610 x 325 x 155 | 155 | 130550 | 4273 | 4783 | 25,5 | 86,21 | 10780 | 665,7 | 1024 | 7,3 | 7,4 | 209,5 | 9436 | 1 | 2 | 4 | 4 | 107 | 123 | 78 | 94 |
| UB 610 x 305 x 238 | 238 | 210330 | 6616 | 7516 | 26,2 | 127,2 | 15830 | 1017 | 1575 | 7,2 | 10,4 | 802,9 | 14430 | 1 | 1 | 2 | 3 | 70 | 80 | 52 | 62 |
| UB 610 x 305 x 179 | 179 | 153880 | 4962 | 5578 | 25,9 | 96,99 | 11410 | 743,1 | 1145 | 7,0 | 8,4 | 350,5 | 10130 | 1 | 1 | 4 | 4 | 92 | 105 | 68 | 81 |
| UB 610 x 305 x 149 | 149 | 126730 | 4139 | 4624 | 25,7 | 81,25 | 9309 | 610,8 | 938,6 | 6,9 | 7,4 | 207,6 | 8165 | 1 | 1 | 4 | 4 | 109 | 125 | 80 | 96 |
| UB 610 x 229 x 153 | 153 | 126750 | 4069 | 4657 | 25,3 | 97,12 | 5001 | 436,8 | 684,9 | 5,0 | 8,7 | 315,8 | 4456 | 1 | 1 | 4 | 4 | 95 | 106 | 75 | 86 |
| UB 610 x 229 x 140 | 140 | 113390 | 3674 | 4199 | 25,0 | 90,23 | 4508 | 391,7 | 613,9 | 5,0 | 8,0 | 233,4 | 3978 | 1 | 1 | 4 | 4 | 103 | 116 | 81 | 94 |
| UB 610 x 229 x 125 | 125 | 100220 | 3274 | 3733 | 24,9 | 81,79 | 3935 | 343,6 | 537,7 | 4,9 | 7,4 | 168,2 | 3444 | 1 | 1 | 4 | 4 | 115 | 129 | 90 | 104 |
| UB 610 x 229 x 113 | 113 | 88930 | 2927 | 3338 | 24,6 | 75,87 | 3436 | 301,2 | 471,5 | 4,8 | 6,9 | 123,0 | 2984 | 1 | 1 | 4 | 4 | 126 | 142 | 99 | 114 |
| UB 610 x 229 x 101 | 101 | 77390 | 2568 | 2938 | 24,3 | 71,07 | 2917 | 256,3 | 402,4 | 4,7 | 6,3 | 86,67 | 2512 | 1 | 1 | 4 | 4 | 140 | 157 | 109 | 127 |
| UB 610 x 178 x 92 | 92,0 | 64680 | 2145 | 2514 | 23,4 | 69,44 | 1441 | 161,0 | 258,5 | 3,5 | 5,6 | 71,30 | 1239 | 1 | 1 | 4 | 4 | 144 | 160 | 118 | 133 |
| UB 610 x 178 x 82 | 82,0 | 56030 | 1870 | 2198 | 23,1 | 63,39 | 1208 | 135,8 | 218,2 | 3,4 | 5,0 | 49,07 | 1033 | 1 | 2 | 4 | 4 | 162 | 179 | 132 | 149 |

Universal beams (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas universales (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

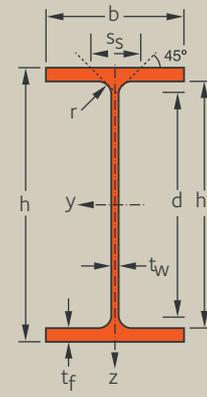
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki uniwersalne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | |
|---|--------------------------------------|-------|----------------|----------------|------|----------------|-------|---------------------------------------|-------------------|-------------------|---|---|----|-------------|-----------------|-------------|---|----|-------------|------------|--------|----|---|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _C | S355 | | | | S460 | | | | S500 | | | | |
| G | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML | |
| UB 533 x 210 x 138 ♦ | 138 | 549,0 | 214,0 | 14,7 | 23,6 | 13 | 501,9 | 475,9 | 176,2 | 1,902 | 13,75 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 533 x 210 x 122 40 | 122 | 544,5 | 211,9 | 12,7 | 21,3 | 13 | 501,9 | 475,9 | 155,4 | 1,889 | 15,48 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 533 x 210 x 109 40 | 109 | 539,5 | 210,8 | 11,6 | 18,8 | 13 | 501,9 | 475,9 | 138,9 | 1,877 | 17,21 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 533 x 210 x 101 | 101 | 536,7 | 210,0 | 10,8 | 17,4 | 13 | 501,9 | 475,9 | 128,7 | 1,869 | 18,49 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 533 x 210 x 92 | 92,1 | 533,1 | 209,3 | 10,1 | 15,6 | 13 | 501,9 | 475,9 | 117,4 | 1,861 | 20,19 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 533 x 210 x 82 | 82,2 | 528,3 | 208,8 | 9,6 | 13,2 | 13 | 501,9 | 475,9 | 104,7 | 1,850 | 22,50 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 533 x 165 x 85 ♦ | 85,0 | 535,0 | 166,0 | 10,3 | 16,5 | 13 | 502,0 | 476,0 | 107,9 | 1,691 | 19,96 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - |
| UB 533 x 165 x 74 ♦ | 74,0 | 529,0 | 166,0 | 9,7 | 13,6 | 13 | 502,0 | 476,0 | 95,3 | 1,680 | 22,46 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - |
| UB 533 x 165 x 66 ♦ | 66,0 | 525,0 | 165,0 | 8,9 | 11,4 | 13 | 502,0 | 476,0 | 83,8 | 1,670 | 25,40 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - |
| UB 457 x 191 x 106 ♦ 40 | 106 | 469,0 | 194,0 | 12,6 | 20,6 | 10 | 428,0 | 408,0 | 134,7 | 1,672 | 15,81 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 191 x 98 40 | 98,3 | 467,2 | 192,8 | 11,4 | 19,6 | 10 | 428,0 | 408,0 | 125,3 | 1,666 | 16,95 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 191 x 89 | 89,3 | 463,4 | 191,9 | 10,5 | 17,7 | 10 | 428,0 | 408,0 | 113,8 | 1,656 | 18,55 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 191 x 82 | 82,0 | 460,0 | 191,3 | 9,9 | 16,0 | 10 | 428,0 | 408,0 | 104,5 | 1,648 | 20,10 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 191 x 74 | 74,3 | 457,0 | 190,4 | 9,0 | 14,5 | 10 | 428,0 | 408,0 | 94,6 | 1,640 | 22,09 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 191 x 67 | 67,1 | 453,4 | 189,9 | 8,5 | 12,7 | 10 | 428,0 | 408,0 | 85,5 | 1,632 | 24,32 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 152 x 82 40 | 82,1 | 465,8 | 155,3 | 10,5 | 18,9 | 10 | 428,0 | 408,0 | 104,5 | 1,515 | 18,47 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 152 x 74 40 | 74,2 | 462,0 | 154,4 | 9,6 | 17,0 | 10 | 428,0 | 408,0 | 94,5 | 1,505 | 20,30 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 152 x 67 40 | 67,2 | 458,0 | 153,8 | 9,0 | 15,0 | 10 | 428,0 | 408,0 | 85,6 | 1,496 | 22,28 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 152 x 60 | 59,8 | 454,6 | 152,9 | 8,1 | 13,3 | 10 | 428,0 | 408,0 | 76,2 | 1,487 | 24,86 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 457 x 152 x 52 | 52,3 | 449,8 | 152,4 | 7,6 | 10,9 | 10 | 428,0 | 408,0 | 66,6 | 1,477 | 28,25 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 178 x 85 ♦ | 85,0 | 417,0 | 181,0 | 10,9 | 18,2 | 10 | 380,8 | 360,8 | 108,2 | 1,519 | 17,88 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 178 x 74 | 74,2 | 412,8 | 179,5 | 9,5 | 16,0 | 10 | 380,8 | 360,8 | 94,5 | 1,507 | 20,32 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 178 x 67 | 67,1 | 409,4 | 178,8 | 8,8 | 14,3 | 10 | 380,8 | 360,8 | 85,5 | 1,499 | 22,33 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 178 x 60 | 60,1 | 406,4 | 177,9 | 7,9 | 12,8 | 10 | 380,8 | 360,8 | 76,5 | 1,491 | 24,83 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 178 x 54 | 54,1 | 402,6 | 177,7 | 7,7 | 10,9 | 10 | 380,8 | 360,8 | 69,0 | 1,483 | 27,41 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 140 x 53 ♦ | 53,3 | 406,6 | 143,3 | 7,9 | 12,9 | 10 | 380,8 | 360,8 | 68,0 | 1,353 | 25,38 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 140 x 46 | 46,0 | 403,2 | 142,2 | 6,8 | 11,2 | 10 | 380,8 | 360,8 | 58,6 | 1,344 | 29,21 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 406 x 140 x 39 | 39,0 | 398,0 | 141,8 | 6,4 | 8,6 | 10 | 380,8 | 360,8 | 49,7 | 1,333 | 34,22 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 356 x 171 x 67 40 | 67,1 | 363,4 | 173,2 | 9,1 | 15,7 | 10 | 332,0 | 312,0 | 85,5 | 1,384 | 20,63 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 356 x 171 x 57 | 57,0 | 358,0 | 172,2 | 8,1 | 13,0 | 10 | 332,0 | 312,0 | 72,6 | 1,371 | 24,08 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 356 x 171 x 51 | 51,0 | 355,0 | 171,5 | 7,4 | 11,5 | 10 | 332,0 | 312,0 | 64,9 | 1,364 | 26,78 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 356 x 171 x 45 | 45,0 | 351,4 | 171,1 | 7,0 | 9,7 | 10 | 332,0 | 312,0 | 57,3 | 1,356 | 30,15 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |

40 Minimum order: 40t per section and grade or upon agreement.
 Minimum tonnage and delivery conditions upon agreement.
 ♦ Dimensions ArcelorMittal standard

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.
 Plazo mínimo y condiciones de entrega previo acuerdo.
 ♦ Dimensiones estándar de ArcelorMittal

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
 Minimalny tonaż i warunki dostawy po uzgodnieniu.
 ♦ Wymiary standard ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | |
|---|---|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|------------------------------------|---|-------------------------------------|-------------------------------------|----------------------|----------------------|-----------------------------------|------------------------|------------------------------------|-----------------------|----------------------|---|---|------|------|------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | Pure Compression | Contour encasement | Hollow encasement | | | | | |
| | G kg/m | I _y cm ⁴ | W _{ely} cm ³ | W _{ply} cm ³ | i _y cm | A _{vz} cm ² | I _z cm ⁴ | W _{elz} cm ³ | W _{plz} cm ³ | i _z cm | S _s cm | I _t cm ⁴ | | | | | I _w cm ⁶ x10 ³ | S355 | S460 | S355 | S460 |
| UB 533 x 210 x 138 | 138 | 86120 | 3137 | 3614 | 22,1 | 84,82 | 3869 | 361,6 | 568,9 | 4,6 | 7,7 | 250,9 | 2660 | 1 | 1 | 3 | 4 | 96 | 108 | 74 | 87 |
| UB 533 x 210 x 122 | 122 | 76080 | 2794 | 3197 | 22,1 | 73,43 | 3387 | 319,7 | 499,7 | 4,6 | 7,0 | 178,8 | 2311 | 1 | 1 | 4 | 4 | 108 | 122 | 84 | 97 |
| UB 533 x 210 x 109 | 109 | 66860 | 2478 | 2830 | 21,9 | 66,73 | 2942 | 279,2 | 435,8 | 4,6 | 6,4 | 126,7 | 1989 | 1 | 1 | 4 | 4 | 120 | 135 | 93 | 108 |
| UB 533 x 210 x 101 | 101 | 61550 | 2293 | 2613 | 21,8 | 62,05 | 2692 | 256,3 | 399,5 | 4,5 | 6,0 | 101,3 | 1810 | 1 | 1 | 4 | 4 | 129 | 145 | 100 | 116 |
| UB 533 x 210 x 92 | 92,1 | 55260 | 2073 | 2361 | 21,6 | 57,77 | 2389 | 228,3 | 355,6 | 4,5 | 5,6 | 75,95 | 1596 | 1 | 1 | 4 | 4 | 141 | 159 | 109 | 126 |
| UB 533 x 210 x 82 | 82,2 | 47570 | 1801 | 2060 | 21,3 | 54,33 | 2007 | 192,2 | 300,4 | 4,3 | 5,1 | 51,75 | 1328 | 1 | 2 | 4 | 4 | 157 | 177 | 121 | 141 |
| UB 533 x 165 x 85 | 85,0 | 48580 | 1816 | 2105 | 21,2 | 59,14 | 1263 | 152,2 | 241,8 | 3,4 | 5,8 | 73,98 | 845,4 | 1 | 1 | 4 | 4 | 141 | 157 | 115 | 130 |
| UB 533 x 165 x 74 | 74,0 | 41090 | 1553 | 1810 | 20,7 | 54,98 | 1041 | 125,4 | 200,3 | 3,3 | 5,2 | 48,20 | 688,5 | 1 | 1 | 4 | 4 | 159 | 176 | 128 | 146 |
| UB 533 x 165 x 66 | 66,0 | 35100 | 1337 | 1563 | 20,4 | 50,12 | 857,3 | 103,9 | 166,1 | 3,1 | 4,6 | 32,15 | 562,8 | 1 | 2 | 4 | 4 | 180 | 199 | 145 | 165 |
| UB 457 x 191 x 106 | 106 | 48800 | 2081 | 2386 | 19,0 | 61,47 | 2514 | 259,2 | 405,3 | 4,3 | 6,5 | 145,5 | 1260 | 1 | 1 | 3 | 4 | 110 | 124 | 84 | 98 |
| UB 457 x 191 x 98 | 98,3 | 45710 | 1956 | 2231 | 19,1 | 55,80 | 2346 | 243,4 | 378,8 | 4,3 | 6,2 | 121,0 | 1172 | 1 | 1 | 4 | 4 | 118 | 133 | 90 | 105 |
| UB 457 x 191 x 89 | 89,3 | 40990 | 1769 | 2012 | 18,9 | 51,19 | 2089 | 217,7 | 338,3 | 4,2 | 5,7 | 90,52 | 1035 | 1 | 1 | 4 | 4 | 129 | 146 | 98 | 115 |
| UB 457 x 191 x 82 | 82,0 | 37030 | 1610 | 1830 | 18,8 | 48,01 | 1870 | 195,5 | 303,8 | 4,2 | 5,3 | 69,06 | 920,0 | 1 | 1 | 4 | 4 | 139 | 158 | 106 | 125 |
| UB 457 x 191 x 74 | 74,3 | 33300 | 1457 | 1651 | 18,7 | 43,58 | 1671 | 175,5 | 272,0 | 4,2 | 4,9 | 51,67 | 816,5 | 1 | 1 | 4 | 4 | 153 | 173 | 117 | 137 |
| UB 457 x 191 x 67 | 67,1 | 29360 | 1295 | 1470 | 18,5 | 40,85 | 1452 | 152,9 | 237,2 | 4,1 | 4,5 | 37,03 | 703,8 | 1 | 1 | 4 | 4 | 169 | 191 | 128 | 151 |
| UB 457 x 152 x 82 | 82,1 | 36570 | 1570 | 1810 | 18,7 | 51,56 | 1184 | 152,5 | 240,3 | 3,3 | 6,0 | 89,04 | 589,0 | 1 | 1 | 4 | 4 | 130 | 145 | 104 | 119 |
| UB 457 x 152 x 74 | 74,2 | 32650 | 1413 | 1625 | 18,5 | 46,97 | 1046 | 135,5 | 213,0 | 3,3 | 5,5 | 65,77 | 516,2 | 1 | 1 | 4 | 4 | 143 | 159 | 114 | 131 |
| UB 457 x 152 x 67 | 67,2 | 28910 | 1262 | 1452 | 18,3 | 43,72 | 912,5 | 118,6 | 186,6 | 3,2 | 5,0 | 47,54 | 446,2 | 1 | 1 | 4 | 4 | 157 | 175 | 125 | 143 |
| UB 457 x 152 x 60 | 59,8 | 25480 | 1121 | 1286 | 18,2 | 39,26 | 794,6 | 103,9 | 163,0 | 3,2 | 4,6 | 33,73 | 385,7 | 1 | 1 | 4 | 4 | 175 | 195 | 139 | 159 |
| UB 457 x 152 x 52 | 52,3 | 21350 | 949,4 | 1095 | 17,9 | 36,39 | 644,9 | 84,63 | 133,2 | 3,1 | 4,1 | 21,29 | 309,6 | 1 | 2 | 4 | 4 | 199 | 222 | 158 | 181 |
| UB 406 x 178 x 85 | 85,0 | 31520 | 1512 | 1724 | 17,0 | 47,96 | 1803 | 199,2 | 310,0 | 4,0 | 5,9 | 92,42 | 715,1 | 1 | 1 | 3 | 4 | 124 | 140 | 94 | 111 |
| UB 406 x 178 x 74 | 74,2 | 27290 | 1322 | 1500 | 16,9 | 41,75 | 1545 | 172,1 | 266,9 | 4,0 | 5,3 | 62,61 | 607,0 | 1 | 1 | 4 | 4 | 141 | 160 | 106 | 125 |
| UB 406 x 178 x 67 | 67,1 | 24310 | 1188 | 1345 | 16,8 | 38,48 | 1364 | 152,6 | 236,5 | 3,9 | 4,9 | 45,98 | 531,6 | 1 | 1 | 4 | 4 | 154 | 175 | 117 | 138 |
| UB 406 x 178 x 60 | 60,1 | 21580 | 1062 | 1198 | 16,7 | 34,51 | 1203 | 135,2 | 209,0 | 3,9 | 4,5 | 33,21 | 465,1 | 1 | 1 | 4 | 4 | 172 | 195 | 130 | 153 |
| UB 406 x 178 x 54 | 54,1 | 18710 | 929,4 | 1053 | 16,4 | 33,19 | 1021 | 114,9 | 178,2 | 3,8 | 4,1 | 23,04 | 391,0 | 1 | 2 | 4 | 4 | 189 | 215 | 143 | 168 |
| UB 406 x 140 x 53 | 53,3 | 18270 | 898,7 | 1030 | 16,4 | 34,54 | 634,5 | 88,56 | 138,9 | 3,0 | 4,5 | 28,85 | 245,1 | 1 | 1 | 4 | 4 | 178 | 199 | 141 | 162 |
| UB 406 x 140 x 46 | 46,0 | 15670 | 777,4 | 886,9 | 16,3 | 29,75 | 538,0 | 75,67 | 118,1 | 3,0 | 4,0 | 18,94 | 206,1 | 1 | 2 | 4 | 4 | 205 | 229 | 162 | 186 |
| UB 406 x 140 x 39 | 39,0 | 12490 | 627,9 | 723,0 | 15,8 | 27,50 | 409,7 | 57,79 | 90,82 | 2,8 | 3,5 | 10,64 | 154,9 | 1 | 2 | 4 | 4 | 240 | 269 | 189 | 218 |
| UB 356 x 171 x 67 | 67,1 | 19450 | 1070 | 1210 | 15,0 | 35,63 | 1362 | 157,2 | 242,9 | 3,9 | 5,2 | 55,53 | 410,9 | 1 | 1 | 4 | 4 | 142 | 162 | 105 | 126 |
| UB 356 x 171 x 57 | 57,0 | 16020 | 895,4 | 1009 | 14,8 | 31,40 | 1108 | 128,7 | 198,7 | 3,9 | 4,5 | 33,27 | 329,2 | 1 | 1 | 4 | 4 | 165 | 189 | 122 | 146 |
| UB 356 x 171 x 51 | 51,0 | 14120 | 795,8 | 895,4 | 14,7 | 28,57 | 968,2 | 112,9 | 174,1 | 3,8 | 4,2 | 23,72 | 285,1 | 1 | 1 | 4 | 4 | 184 | 210 | 136 | 162 |
| UB 356 x 171 x 45 | 45,0 | 12050 | 686,2 | 774 | 14,5 | 26,71 | 811,0 | 94,80 | 146,5 | 3,7 | 3,8 | 15,77 | 236,3 | 2 | 3 | 4 | 4 | 207 | 236 | 152 | 182 |

Universal beams (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Vigas universales (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

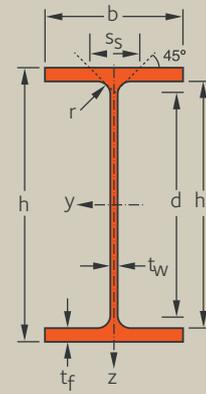
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Belki uniwersalne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------------------|----------------------|---------|----------------------|---------------------------------------|----------------------|-------------------------------------|---|-------------|---|----|-------------|-----------------|-------------|---|----|-------------|------------|--------|----|---|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | r mm | h ₁ mm | d mm | A cm ² | A _L m ² /m | A _C m ² /t | S355 | | | | S460 | | | | S500 | | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO / ML10 | JO / M | ML | |
| UB 356 x 127 x 39 | 39,1 | 353,4 | 126,0 | 6,6 | 10,7 | 10 | 332,0 | 312,0 | 49,8 | 1,180 | 30,22 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 356 x 127 x 33 | 33,1 | 349,0 | 125,4 | 6,0 | 8,5 | 10 | 332,0 | 312,0 | 42,1 | 1,170 | 35,41 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 305 x 165 x 54 | 54,0 | 310,4 | 166,9 | 7,9 | 13,7 | 9 | 283,0 | 265,0 | 68,8 | 1,257 | 23,28 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 305 x 165 x 46 | 46,1 | 306,6 | 165,7 | 6,7 | 11,8 | 9 | 283,0 | 265,0 | 58,7 | 1,247 | 27,03 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 305 x 165 x 40 | 40,3 | 303,4 | 165,0 | 6,0 | 10,2 | 9 | 283,0 | 265,0 | 51,3 | 1,239 | 30,75 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 305 x 127 x 48 | 48,1 | 311,0 | 125,3 | 9,0 | 14,0 | 9 | 283,0 | 265,0 | 61,2 | 1,090 | 22,67 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - | |
| UB 305 x 127 x 42 | 41,9 | 307,2 | 124,3 | 8,0 | 12,1 | 9 | 283,0 | 265,0 | 53,4 | 1,080 | 25,76 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - | |
| UB 305 x 127 x 37 | 37,0 | 304,4 | 123,4 | 7,1 | 10,7 | 9 | 283,0 | 265,0 | 47,2 | 1,073 | 28,96 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - | |
| UB 305 x 102 x 33 | 32,8 | 312,7 | 102,4 | 6,6 | 10,8 | 8 | 291,1 | 275,1 | 41,8 | 1,008 | 30,66 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 305 x 102 x 28 | 28,2 | 308,7 | 101,8 | 6,0 | 8,8 | 8 | 291,1 | 275,1 | 35,9 | 0,999 | 35,42 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 305 x 102 x 25 | 24,8 | 305,1 | 101,6 | 5,8 | 7,0 | 8 | 291,1 | 275,1 | 31,6 | 0,991 | 39,88 | ✓ | ✓ | - | ✓ | ✓ | - | ✓ | - | - | - | - | - | |
| UB 254 x 146 x 43 | 40 | 43,0 | 259,6 | 147,3 | 7,2 | 12,7 | 8 | 234,2 | 218,2 | 54,8 | 1,080 | 25,09 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UB 254 x 146 x 37 | 37,0 | 256,0 | 146,4 | 6,3 | 10,9 | 8 | 234,2 | 218,2 | 47,2 | 1,071 | 28,89 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 254 x 146 x 31 | 31,1 | 251,4 | 146,1 | 6,0 | 8,6 | 8 | 234,2 | 218,2 | 39,7 | 1,061 | 34,02 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 254 x 102 x 28 | 28,3 | 260,4 | 102,2 | 6,3 | 10,0 | 8 | 240,4 | 224,4 | 36,1 | 0,903 | 31,83 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 254 x 102 x 25 | 25,2 | 257,2 | 101,9 | 6,0 | 8,4 | 8 | 240,4 | 224,4 | 32,0 | 0,896 | 35,57 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 254 x 102 x 22 | 22,0 | 254,0 | 101,6 | 5,7 | 6,8 | 8 | 240,4 | 224,4 | 28,0 | 0,889 | 40,35 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 203 x 133 x 30 | 30,0 | 206,8 | 133,9 | 6,4 | 9,6 | 8 | 187,6 | 171,6 | 38,2 | 0,923 | 30,73 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 203 x 133 x 25 | 25,1 | 203,2 | 133,2 | 5,7 | 7,8 | 8 | 187,6 | 171,6 | 32,0 | 0,914 | 36,36 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 203 x 102 x 23 | 23,1 | 203,2 | 101,8 | 5,4 | 9,3 | 8 | 184,6 | 168,6 | 29,4 | 0,789 | 34,13 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 178 x 102 x 19 | 19,0 | 177,8 | 101,2 | 4,8 | 7,9 | 8 | 162,0 | 146,0 | 24,3 | 0,737 | 38,61 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - | |
| UB 152 x 89 x 16 | 16,0 | 152,4 | 88,7 | 4,5 | 7,7 | 8 | 137,0 | 121,0 | 20,3 | 0,637 | 39,83 | ✓ | ✓ | - | - | ✓ | - | ✓ | - | - | - | - | - | |
| UB 127 x 76 x 13 | 13,0 | 127,0 | 76,0 | 4,0 | 7,6 | 8 | 111,8 | 95,8 | 16,5 | 0,536 | 41,20 | ✓ | ✓ | - | - | ✓ | - | ✓ | - | - | - | - | - | |

40 Minimum order: 40t per section and grade or upon agreement.
Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.
Plazo mínimo y condiciones de entrega previo acuerdo.

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
Minimalny tonaż i warunki dostawy po uzgodnieniu.

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju $A_p/V (m^{-1})$ | | | |
|---|---|--------------------------|------------------------------|------------------------------|-------------|-----------------------------|---|------------------------------|------------------------------|-------------|-------------|--------------------------|--|------------------------------------|---------------------|-----------------------|----------------------|--|------|------|------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | | Pure Bending y-y | Pure Compression | Contour encasement | Hollow encasement | | | | |
| | G kg/m | I_y cm ⁴ | W_{ely} cm ³ | W_{ply} cm ³ | i_y cm | A_{vz} cm ² | I_z cm ⁴ | W_{elz} cm ³ | W_{plz} cm ³ | i_z cm | S_s cm | I_t cm ⁴ | I_w cm ⁶ x10 ³ | | | | | S355 | S460 | S355 | S460 |
| UB 356 x 127 x 39 39,1 | 10160 | 575,1 | 657,9 | 14,2 | 25,61 | 357,8 | 56,79 | 89,02 | 2,6 | 3,9 | 15,02 | 104,7 | 1 | 1 | 4 | 4 | 212 | 237 | 167 | 193 | |
| UB 356 x 127 x 33 33,1 | 8240 | 472,2 | 542,3 | 13,9 | 22,98 | 280,2 | 44,69 | 70,26 | 2,5 | 3,4 | 8,736 | 80,97 | 1 | 2 | 4 | 4 | 248 | 278 | 195 | 225 | |
| UB 305 x 165 x 54 54,0 | 11690 | 753,7 | 846,2 | 13,0 | 26,60 | 1062 | 127,3 | 195,6 | 3,9 | 4,5 | 34,83 | 233,6 | 1 | 1 | 3 | 4 | 159 | 183 | 115 | 139 | |
| UB 305 x 165 x 46 46,1 | 9901 | 645,8 | 720,2 | 12,9 | 22,57 | 895,6 | 108,1 | 165,5 | 3,9 | 4,0 | 22,23 | 194,3 | 1 | 1 | 4 | 4 | 184 | 212 | 133 | 161 | |
| UB 305 x 165 x 40 40,3 | 8505 | 560,6 | 623,2 | 12,8 | 20,12 | 764,3 | 92,65 | 141,7 | 3,8 | 3,6 | 14,76 | 164,1 | 1 | 2 | 4 | 4 | 209 | 241 | 150 | 182 | |
| UB 305 x 127 x 48 48,1 | 9577 | 615,9 | 710,8 | 12,5 | 29,94 | 461,0 | 73,59 | 116,0 | 2,7 | 4,7 | 31,82 | 101,2 | 1 | 1 | 2 | 3 | 157 | 178 | 122 | 142 | |
| UB 305 x 127 x 42 41,9 | 8198 | 533,7 | 613,7 | 12,3 | 26,48 | 388,7 | 62,55 | 98,42 | 2,6 | 4,2 | 21,17 | 84,31 | 1 | 1 | 3 | 4 | 179 | 202 | 138 | 162 | |
| UB 305 x 127 x 37 37,0 | 7173 | 471,3 | 539,6 | 12,3 | 23,47 | 336,1 | 54,48 | 85,42 | 2,6 | 3,9 | 14,79 | 72,26 | 1 | 1 | 4 | 4 | 201 | 227 | 155 | 181 | |
| UB 305 x 102 x 33 32,8 | 6512 | 416,5 | 481,5 | 12,4 | 22,20 | 194,1 | 37,91 | 60,07 | 2,1 | 3,7 | 12,30 | 44,03 | 1 | 1 | 4 | 4 | 216 | 241 | 174 | 198 | |
| UB 305 x 102 x 28 28,2 | 5376 | 348,3 | 403,6 | 12,2 | 19,95 | 155,3 | 30,52 | 48,48 | 2,0 | 3,2 | 7,478 | 34,79 | 1 | 1 | 4 | 4 | 250 | 278 | 200 | 228 | |
| UB 305 x 102 x 25 24,8 | 4466 | 292,7 | 342,7 | 11,8 | 18,95 | 122,9 | 24,20 | 38,83 | 1,9 | 2,9 | 4,833 | 27,18 | 1 | 1 | 4 | 4 | 281 | 313 | 225 | 257 | |
| UB 254 x 146 x 43 43,0 | 6550 | 504,6 | 566,9 | 10,9 | 20,35 | 677,3 | 91,97 | 141,1 | 3,5 | 4,1 | 24,02 | 103 | 1 | 1 | 2 | 4 | 170 | 197 | 122 | 148 | |
| UB 254 x 146 x 37 37,0 | 5543 | 433,1 | 483,8 | 10,8 | 17,73 | 570,6 | 77,95 | 119,4 | 3,4 | 3,7 | 15,43 | 85,61 | 1 | 1 | 4 | 4 | 196 | 227 | 139 | 170 | |
| UB 254 x 146 x 31 31,1 | 4420 | 351,6 | 393,6 | 10,5 | 16,49 | 447,5 | 61,26 | 94,15 | 3,3 | 3,2 | 8,629 | 65,87 | 1 | 3 | 4 | 4 | 230 | 267 | 163 | 200 | |
| UB 254 x 102 x 28 28,3 | 4012 | 308,1 | 353,4 | 10,5 | 17,92 | 178,5 | 34,94 | 54,88 | 2,2 | 3,5 | 9,665 | 27,88 | 1 | 1 | 4 | 4 | 222 | 250 | 172 | 201 | |
| UB 254 x 102 x 25 25,2 | 3421 | 266,0 | 306,1 | 10,3 | 16,82 | 148,7 | 29,18 | 46,03 | 2,1 | 3,2 | 6,495 | 22,92 | 1 | 1 | 4 | 4 | 248 | 279 | 192 | 224 | |
| UB 254 x 102 x 22 22,0 | 2848 | 224,2 | 259,6 | 10,0 | 15,72 | 119,3 | 23,49 | 37,30 | 2,0 | 2,8 | 4,203 | 18,15 | 1 | 1 | 4 | 4 | 281 | 317 | 217 | 253 | |
| UB 203 x 133 x 30 30,0 | 2900 | 280,4 | 314,8 | 8,7 | 14,70 | 384,6 | 57,45 | 88,25 | 3,1 | 3,4 | 10,39 | 37,34 | 1 | 1 | 1 | 2 | 206 | 241 | 143 | 178 | |
| UB 203 x 133 x 25 25,1 | 2344 | 230,7 | 258,2 | 8,5 | 12,93 | 307,6 | 46,19 | 70,97 | 3,0 | 3,0 | 6,032 | 29,32 | 1 | 2 | 2 | 4 | 244 | 285 | 169 | 210 | |
| UB 203 x 102 x 23 23,1 | 2109 | 207,5 | 234,5 | 8,4 | 12,50 | 163,8 | 32,19 | 49,78 | 2,3 | 3,3 | 7,099 | 15,36 | 1 | 1 | 3 | 4 | 233 | 268 | 173 | 207 | |
| UB 178 x 102 x 19 19,0 | 1359 | 152,8 | 171,6 | 7,4 | 9,968 | 136,7 | 27,02 | 41,61 | 2,3 | 2,9 | 4,471 | 9,847 | 1 | 1 | 2 | 4 | 262 | 303 | 188 | 229 | |
| UB 152 x 89 x 16 16,0 | 836,5 | 109,7 | 123,6 | 6,4 | 8,292 | 89,76 | 20,24 | 31,20 | 2,0 | 2,9 | 3,619 | 4,687 | 1 | 1 | 2 | 2 | 269 | 313 | 193 | 237 | |
| UB 127 x 76 x 13 13,0 | 474,9 | 74,79 | 84,43 | 5,3 | 6,541 | 55,75 | 14,67 | 22,60 | 1,8 | 2,8 | 2,906 | 1,981 | 1 | 1 | 1 | 2 | 278 | 324 | 199 | 245 | |

Universal columns

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Columnas universales

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

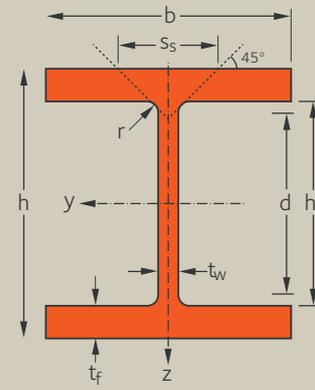
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Słupy uniwersalne

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | |
|---|--------------------------------------|---|----------------|----------------|---|----------------|---|---------------------------------------|----------------|----------------|---|---|----|-------------|-----------------|-------------|---|----|-------------|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _C | S355 | | | | S460 | | | | S500 |
| | | | | | | | | | | | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO / MLO / ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W |

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|------|-------|-------|-------|-------|----|-------|-------|--------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| UC 356 x 406 x 1299 | 1299 | 600,0 | 476,0 | 100,0 | 140,0 | 20 | 320,0 | 280,0 | 1654,7 | 2,870 | 2,207 | ✓ | HI | - | - | - | ✓ | HI | - | - | - | ✓ | - |
| UC 356 x 406 x 1202 | 1202 | 580,0 | 471,0 | 95,0 | 130,0 | 20 | 320,0 | 280,0 | 1530,5 | 2,820 | 2,345 | ✓ | HI | - | - | - | ✓ | HI | - | - | - | ✓ | - |
| UC 356 x 406 x 1086 | 1086 | 569,0 | 454,0 | 78,0 | 125,0 | 20 | 320,0 | 280,0 | 1385,8 | 2,764 | 2,538 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 990 | 990 | 550,0 | 448,0 | 71,9 | 115,0 | 20 | 320,0 | 280,0 | 1262,4 | 2,714 | 2,735 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 900 | 900 | 531,0 | 442,0 | 65,9 | 106,0 | 20 | 320,0 | 280,0 | 1149,2 | 2,664 | 2,949 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 818 | 818 | 514,0 | 437,0 | 60,5 | 97,0 | 20 | 320,0 | 280,0 | 1043,3 | 2,621 | 3,196 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 744 | 744 | 498,0 | 432,0 | 55,6 | 88,9 | 20 | 320,0 | 280,0 | 948,1 | 2,578 | 3,459 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 677 | 677 | 483,0 | 428,0 | 51,2 | 81,5 | 20 | 320,0 | 280,0 | 863,4 | 2,541 | 3,743 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 634 | 634 | 474,6 | 424,0 | 47,6 | 77,0 | 20 | 320,0 | 280,0 | 807,5 | 2,516 | 3,962 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 592 | 592 | 465,0 | 421,0 | 45,0 | 72,3 | 20 | 320,0 | 280,0 | 754,9 | 2,490 | 4,194 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 551 | 551 | 455,6 | 418,5 | 42,1 | 67,5 | 20 | 320,0 | 280,0 | 701,9 | 2,467 | 4,468 | ✓ | HI | HI | - | - | ✓ | HI | HI | - | - | ✓ | ✓ |
| UC 356 x 406 x 509 | 509 | 446,0 | 416,0 | 39,1 | 62,7 | 20 | 320,0 | 280,0 | 649,0 | 2,443 | 4,785 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UC 356 x 406 x 467 | 467 | 436,6 | 412,2 | 35,8 | 58,0 | 20 | 320,0 | 280,0 | 594,9 | 2,416 | 5,161 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UC 356 x 406 x 393 [40] | 393 | 419,0 | 407,0 | 30,6 | 49,2 | 20 | 320,0 | 280,0 | 500,6 | 2,370 | 6,014 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UC 356 x 406 x 340 [40] | 340 | 406,4 | 403,0 | 26,6 | 42,9 | 20 | 320,0 | 280,0 | 433,0 | 2,337 | 6,852 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | - | ✓ | ✓ |
| UC 356 x 406 x 287 | 287 | 393,6 | 399,0 | 22,6 | 36,5 | 20 | 320,0 | 280,0 | 365,7 | 2,304 | 7,994 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 356 x 406 x 235 | 235 | 381,0 | 394,8 | 18,4 | 30,2 | 20 | 320,0 | 280,0 | 299,0 | 2,270 | 9,611 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|-----|-------|-------|------|------|----|-------|-------|-------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| UC 356 x 368 x 202 [40] | 202 | 374,6 | 374,7 | 16,5 | 27,0 | 20 | 320,0 | 280,0 | 257,2 | 2,181 | 10,74 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 356 x 368 x 177 [40] | 177 | 368,2 | 372,6 | 14,4 | 23,8 | 20 | 320,0 | 280,0 | 225,5 | 2,164 | 12,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 356 x 368 x 153 [40] | 153 | 362,0 | 370,5 | 12,3 | 20,7 | 20 | 320,0 | 280,0 | 194,8 | 2,147 | 13,94 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 356 x 368 x 129 [40] | 129 | 355,6 | 368,6 | 10,4 | 17,5 | 20 | 320,0 | 280,0 | 164,3 | 2,130 | 16,37 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|------|-------|-------|------|------|----|-------|-------|-------|-------|-------|---|----|----|---|----|---|----|----|---|----|---|---|
| UC 305 x 305 x 342 ♦ | 342 | 382,0 | 328,0 | 32,6 | 52,6 | 20 | 277,1 | 237,1 | 437,2 | 1,976 | 5,738 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UC 305 x 305 x 313 ♦ | 313 | 374,0 | 325,0 | 30,0 | 48,3 | 20 | 277,1 | 237,1 | 399,1 | 1,954 | 6,214 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UC 305 x 305 x 283 [40] | 283 | 365,3 | 322,2 | 26,8 | 44,1 | 20 | 277,1 | 237,1 | 360,4 | 1,931 | 6,798 | ✓ | HI | HI | ✓ | - | ✓ | HI | HI | ✓ | ✓ | ✓ | ✓ |
| UC 305 x 305 x 240 [40] | 240 | 352,5 | 318,4 | 23,0 | 37,7 | 20 | 277,1 | 237,1 | 305,8 | 1,898 | 7,870 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 305 x 305 x 198 [40] | 198 | 339,9 | 314,5 | 19,1 | 31,4 | 20 | 277,1 | 237,1 | 252,4 | 1,865 | 9,358 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 305 x 305 x 158 | 158 | 327,1 | 311,2 | 15,8 | 25,0 | 20 | 277,1 | 237,1 | 201,4 | 1,833 | 11,51 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 305 x 305 x 137 [40] | 137 | 320,5 | 309,2 | 13,8 | 21,7 | 20 | 277,1 | 237,1 | 174,4 | 1,816 | 13,15 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 305 x 305 x 118 | 118 | 314,5 | 307,4 | 12,0 | 18,7 | 20 | 277,1 | 237,1 | 150,2 | 1,800 | 15,12 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 305 x 305 x 97 | 96,9 | 307,9 | 305,3 | 9,9 | 15,4 | 20 | 277,1 | 237,1 | 123,4 | 1,783 | 18,19 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |

HI = HISTAR®

[40] Minimum order: 40t per section and grade or upon agreement.
♦ Dimensions ArcelorMittal standard

[40] Pedido mínimo: 40t por sección y grado o previo acuerdo
♦ Dimensiones estándar de ArcelorMittal

[40] Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu..
♦ Standardowe wymiary ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazy na symboly na stránkách 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | | |
|---|---|-----------------|------------------|------------------|-----------------|-----------------|---|------------------|------------------|----------------|-----------------|------------------|------------------------------------|------|---------------------|------|---|----------------------|----------------------|----------------------|----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | G | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | | | | | | | | |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| | | | | | | | | | | | | x10 ³ | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| UC 356 x 406 x 1299 | 1299 | 754950 | 25160 | 33260 | 21,3 | 519,4 | 254410 | 10680 | 16670 | 12,3 | 40,3 | 95520 | 133120 | 1 | 1 | 1 | 1 | 14 | 17 | 10 | 13 |
| UC 356 x 406 x 1202 | 1202 | 663970 | 22890 | 30030 | 20,8 | 482,9 | 228760 | 9714 | 15150 | 12,2 | 37,8 | 77190 | 114600 | 1 | 1 | 1 | 1 | 15 | 18 | 11 | 14 |
| UC 356 x 406 x 1086 | 1086 | 596070 | 20950 | 27230 | 20,7 | 399,7 | 196270 | 8646 | 13380 | 11,8 | 35,1 | 61220 | 96070 | 1 | 1 | 1 | 1 | 17 | 20 | 11 | 15 |
| UC 356 x 406 x 990 | 990 | 519260 | 18880 | 24300 | 20,2 | 362,1 | 173380 | 7740 | 11960 | 11,7 | 32,5 | 47490 | 81520 | 1 | 1 | 1 | 1 | 18 | 21 | 12 | 16 |
| UC 356 x 406 x 900 | 900 | 450550 | 16970 | 21640 | 19,7 | 325,9 | 153360 | 6939 | 10710 | 11,5 | 30,1 | 36880 | 68880 | 1 | 1 | 1 | 1 | 19 | 23 | 13 | 17 |
| UC 356 x 406 x 818 | 818 | 392540 | 15270 | 19270 | 19,3 | 294,5 | 135540 | 6203 | 9566 | 11,3 | 27,7 | 28210 | 58650 | 1 | 1 | 1 | 1 | 21 | 25 | 14 | 18 |
| UC 356 x 406 x 744 | 744 | 342470 | 13750 | 17180 | 18,9 | 266,4 | 119940 | 5553 | 8553 | 11,2 | 25,6 | 21660 | 49980 | 1 | 1 | 1 | 1 | 23 | 27 | 15 | 20 |
| UC 356 x 406 x 677 | 677 | 299820 | 12410 | 15360 | 18,6 | 241,6 | 106880 | 4994 | 7684 | 11,1 | 23,7 | 16680 | 42910 | 1 | 1 | 1 | 1 | 24 | 29 | 16 | 21 |
| UC 356 x 406 x 634 | 634 | 275190 | 11590 | 14250 | 18,4 | 223,4 | 98130 | 4629 | 7112 | 11,0 | 22,5 | 13910 | 38660 | 1 | 1 | 1 | 1 | 26 | 31 | 17 | 22 |
| UC 356 x 406 x 592 | 592 | 250510 | 10770 | 13160 | 18,1 | 209,0 | 90180 | 4284 | 6578 | 10,9 | 21,3 | 11520 | 34660 | 1 | 1 | 1 | 1 | 27 | 33 | 18 | 23 |
| UC 356 x 406 x 551 | 551 | 227280 | 9977 | 12090 | 17,9 | 193,8 | 82680 | 3951 | 6061 | 10,8 | 20 | 9381 | 31050 | 1 | 1 | 1 | 1 | 29 | 35 | 19 | 25 |
| UC 356 x 406 x 509 | 509 | 204880 | 9187 | 11050 | 17,7 | 178,3 | 75410 | 3625 | 5556 | 10,7 | 18,7 | 7513 | 27630 | 1 | 1 | 1 | 1 | 31 | 38 | 20 | 27 |
| UC 356 x 406 x 467 | 467 | 183340 | 8398 | 10020 | 17,5 | 162,1 | 67840 | 3291 | 5037 | 10,6 | 17,5 | 5904 | 24260 | 1 | 1 | 1 | 1 | 34 | 41 | 22 | 28 |
| UC 356 x 406 x 393 | 393 | 146960 | 7014 | 8244 | 17,1 | 136,2 | 55370 | 2721 | 4156 | 10,5 | 15,2 | 3610 | 18900 | 1 | 1 | 1 | 1 | 39 | 47 | 25 | 33 |
| UC 356 x 406 x 340 | 340 | 122880 | 6047 | 7021 | 16,8 | 117,2 | 46850 | 2325 | 3546 | 10,3 | 13,5 | 2390 | 15450 | 1 | 1 | 1 | 1 | 45 | 54 | 28 | 37 |
| UC 356 x 406 x 287 | 287 | 100220 | 5092 | 5834 | 16,5 | 98,73 | 38680 | 1938 | 2951 | 10,2 | 11,9 | 1474 | 12310 | 1 | 1 | 1 | 1 | 52 | 63 | 32 | 43 |
| UC 356 x 406 x 235 | 235 | 79430 | 4169 | 4708 | 16,2 | 80,06 | 30990 | 1570 | 2385 | 10,1 | 10,2 | 833,8 | 9528 | 1 | 1 | 1 | 1 | 62 | 75 | 38 | 52 |
| UC 356 x 368 x 202 | 202 | 66600 | 3556 | 3994 | 16,0 | 71,58 | 23690 | 1264 | 1921 | 9,5 | 9,3 | 575,5 | 7150 | 1 | 1 | 1 | 1 | 70 | 84 | 43 | 58 |
| UC 356 x 368 x 177 | 177 | 57460 | 3121 | 3477 | 15,9 | 62,54 | 20530 | 1102 | 1672 | 9,5 | 8,5 | 395,5 | 6084 | 1 | 2 | 1 | 2 | 79 | 95 | 49 | 65 |
| UC 356 x 368 x 153 | 153 | 48930 | 2703 | 2987 | 15,7 | 53,69 | 17550 | 947,6 | 1436 | 9,4 | 7,7 | 261,4 | 5109 | 2 | 3 | 2 | 3 | 91 | 109 | 56 | 75 |
| UC 356 x 368 x 129 | 129 | 40590 | 2282 | 2501 | 15,6 | 45,59 | 14610 | 792,9 | 1200 | 9,3 | 6,8 | 160,9 | 4174 | 3 | 3 | 3 | 3 | 106 | 129 | 65 | 87 |
| UC 305 x 305 x 342 | 342 | 100770 | 5276 | 6353 | 15,1 | 131,8 | 31030 | 1892 | 2910 | 8,4 | 16,1 | 3570 | 8391 | 1 | 1 | 1 | 1 | 38 | 45 | 25 | 32 |
| UC 305 x 305 x 313 | 313 | 89820 | 4803 | 5735 | 14,9 | 120,4 | 27710 | 1705 | 2619 | 8,3 | 15,0 | 2763 | 7328 | 1 | 1 | 1 | 1 | 41 | 49 | 27 | 35 |
| UC 305 x 305 x 283 | 283 | 79120 | 4332 | 5124 | 14,7 | 107,1 | 24640 | 1529 | 2344 | 8,2 | 13,8 | 2083 | 6340 | 1 | 1 | 1 | 1 | 44 | 53 | 29 | 38 |
| UC 305 x 305 x 240 | 240 | 64450 | 3657 | 4266 | 14,4 | 90,91 | 20310 | 1276 | 1953 | 8,1 | 12,1 | 1306 | 5024 | 1 | 1 | 1 | 1 | 51 | 62 | 33 | 44 |
| UC 305 x 305 x 198 | 198 | 51150 | 3010 | 3459 | 14,1 | 74,91 | 16300 | 1036 | 1582 | 8,0 | 10,5 | 758,1 | 3873 | 1 | 1 | 1 | 1 | 61 | 73 | 39 | 52 |
| UC 305 x 305 x 158 | 158 | 39000 | 2384 | 2699 | 13,8 | 61,16 | 12570 | 807,9 | 1232 | 7,8 | 8,9 | 393,9 | 2865 | 1 | 1 | 1 | 1 | 75 | 90 | 48 | 63 |
| UC 305 x 305 x 137 | 137 | 33060 | 2063 | 2315 | 13,7 | 53,34 | 10700 | 692,2 | 1054 | 7,8 | 8,0 | 261,3 | 2386 | 1 | 1 | 1 | 1 | 86 | 103 | 54 | 72 |
| UC 305 x 305 x 118 | 118 | 27920 | 1775 | 1976 | 13,5 | 46,40 | 9061 | 589,5 | 897 | 7,7 | 7,2 | 170,6 | 1980 | 1 | 2 | 1 | 2 | 98 | 119 | 62 | 82 |
| UC 305 x 305 x 97 | 96,9 | 22500 | 1461 | 1611 | 13,4 | 38,55 | 7309 | 478,8 | 727,7 | 7,6 | 6,4 | 98,40 | 1562 | 3 | 3 | 3 | 3 | 118 | 143 | 74 | 98 |

Universal columns (continued)

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Columnas universales (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

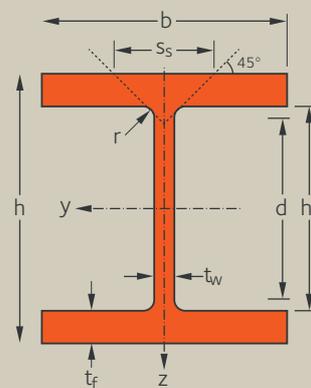
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Śłupy uniwersalne (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | | | | | |
|---|--------------------------------------|---------|---------|----------|----------|---------|----------|---------------------------------------|----------------------|-------------------------|---|-------------|----|----|-------------|-------------|-------------|----|----|-------------|----------|------|----|
| | G kg/m | h mm | b mm | tw mm | tf mm | r mm | h1 mm | d mm | A cm ² | AL m ² /m | Ac m ² /t | S355 | | | | S460 | | | | S500 | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MO/MLO/ML10 | JR/J0/J2/K2 | M | ML | JOW/J2W/K2W | MLO/ML10 | J0/M | ML |
| UC 254 x 254 x 167 | 167 | 289,1 | 265,2 | 19,2 | 31,7 | 13 | 225,7 | 199,7 | 212,9 | 1,578 | 9,441 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 254 x 254 x 132 | 132 | 276,3 | 261,3 | 15,3 | 25,3 | 13 | 225,7 | 199,7 | 168,1 | 1,545 | 11,7 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 254 x 254 x 107 | 107 | 266,7 | 258,8 | 12,8 | 20,5 | 13 | 225,7 | 199,7 | 136,4 | 1,521 | 14,2 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 254 x 254 x 89 | 88,9 | 260,3 | 256,3 | 10,3 | 17,3 | 13 | 225,7 | 199,7 | 113,3 | 1,503 | 16,89 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 254 x 254 x 73 | 73,1 | 254,1 | 254,6 | 8,6 | 14,2 | 13 | 225,7 | 199,7 | 93,1 | 1,487 | 20,33 | ✓ | HI | HI | ✓ | HI | ✓ | HI | HI | ✓ | HI | ✓ | - |
| UC 203 x 203 x 100 | 100 | 229,0 | 210,0 | 14,5 | 23,7 | 10 | 181,2 | 161,2 | 126,7 | 1,252 | 12,59 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 203 x 203 x 86 | 86,1 | 222,2 | 209,1 | 12,7 | 20,5 | 10 | 181,2 | 161,2 | 109,6 | 1,238 | 14,39 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 203 x 203 x 71 | 71,0 | 215,8 | 206,4 | 10,0 | 17,3 | 10 | 181,2 | 161,2 | 90,4 | 1,220 | 17,19 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 203 x 203 x 60 | 60,0 | 209,6 | 205,8 | 9,4 | 14,2 | 10 | 181,2 | 161,2 | 76,4 | 1,206 | 20,12 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 203 x 203 x 52 | 52,0 | 206,2 | 204,3 | 7,9 | 12,5 | 10 | 181,2 | 161,2 | 66,3 | 1,197 | 23,02 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 203 x 203 x 46 | 46,1 | 203,2 | 203,6 | 7,2 | 11,0 | 10 | 181,2 | 161,2 | 58,7 | 1,189 | 25,8 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 152 x 152 x 51 | 51,0 | 170,2 | 157,4 | 11,0 | 15,7 | 8 | 138,8 | 122,8 | 65,2 | 0,934 | 18,24 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 152 x 152 x 44 | 44,0 | 166,0 | 155,9 | 9,5 | 13,6 | 8 | 138,8 | 122,8 | 56,1 | 0,923 | 20,94 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 152 x 152 x 37 | 37,0 | 161,8 | 154,4 | 8,0 | 11,5 | 8 | 138,8 | 122,8 | 47,1 | 0,911 | 24,61 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 152 x 152 x 30 | 30,0 | 157,6 | 152,9 | 6,5 | 9,4 | 8 | 138,8 | 122,8 | 38,3 | 0,900 | 29,92 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |
| UC 152 x 152 x 23 | 23,0 | 152,4 | 152,2 | 5,8 | 6,8 | 8 | 138,8 | 122,8 | 29,2 | 0,888 | 38,61 | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ | - | - | ✓ | - | - |

HI = HISTAR®

Minimum order: 40t per section and grade or upon agreement.
 Minimum tonnage and delivery conditions upon agreement.
 Dimensions ArcelorMittal standard

Pedido mínimo: 40t por sección y grado o previo acuerdo
 Plazo mínimo y condiciones de entrega previo acuerdo
 Dimensiones estándar de ArcelorMittal

Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
 Minimalny tonaż i warunki dostawy po uzgodnieniu.
 Wymiary standard ArcelorMittal

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosiniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V (m ⁻¹) | | | | |
|---|---|-----------------|------------------|------------------|-----------------|-----------------|---|------------------|------------------|----------------|-----------------|-----------------|------------------------|------------------------------------|-----------------------|------|----------------------|---|------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | Pure Compression | Contour encasement | | Hollow encasement | | | | | |
| | G | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | | | I _w | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | | | | | | | | | |
| UC 254 x 254 x 167 | 167 | 30000 | 2075 | 2424 | 11,8 | 59,11 | 9870 | 744,3 | 1137 | 6,8 | 9,7 | 627,5 | 1632 | 1 | 1 | 1 | 1 | 62 | 74 | 40 | 52 | |
| UC 254 x 254 x 132 | 132 | 22530 | 1631 | 1870 | 11,5 | 46,43 | 7531 | 576,4 | 878,4 | 6,6 | 8,1 | 319,2 | 1184 | 1 | 1 | 1 | 1 | 76 | 92 | 48 | 64 | |
| UC 254 x 254 x 107 | 107 | 17510 | 1313 | 1485 | 11,3 | 38,29 | 5927 | 458,0 | 697,1 | 6,5 | 6,9 | 172,9 | 897,4 | 1 | 1 | 1 | 1 | 92 | 111 | 58 | 77 | |
| UC 254 x 254 x 89 | 88,9 | 14270 | 1096 | 1224 | 11,2 | 30,97 | 4857 | 379,0 | 575,3 | 6,5 | 6,0 | 102,6 | 716,6 | 1 | 1 | 1 | 1 | 110 | 133 | 69 | 91 | |
| UC 254 x 254 x 73 | 73,1 | 11410 | 898,4 | 992,7 | 11,0 | 25,77 | 3907 | 306,9 | 465,4 | 6,4 | 5,2 | 57,86 | 561,9 | 2 | 3 | 2 | 3 | 132 | 160 | 82 | 109 | |
| UC 203 x 203 x 100 | 100 | 11320 | 989,1 | 1148 | 9,4 | 35,36 | 3663 | 348,9 | 532,9 | 5,3 | 7,3 | 208,90 | 385,4 | 1 | 1 | 1 | 1 | 82 | 99 | 53 | 69 | |
| UC 203 x 203 x 86 | 86,1 | 9446 | 850,2 | 976,4 | 9,2 | 30,57 | 3127 | 299,1 | 456,2 | 5,3 | 6,5 | 136,50 | 317,6 | 1 | 1 | 1 | 1 | 94 | 113 | 60 | 79 | |
| UC 203 x 203 x 71 | 71,0 | 7615 | 705,7 | 798,4 | 9,1 | 24,16 | 2537 | 245,8 | 373,6 | 5,2 | 5,6 | 80,07 | 249,7 | 1 | 1 | 1 | 1 | 112 | 135 | 71 | 93 | |
| UC 203 x 203 x 60 | 60,0 | 6121 | 584,1 | 655,7 | 8,9 | 22,06 | 2064 | 200,6 | 305,3 | 5,1 | 4,9 | 47,10 | 196,9 | 1 | 1 | 1 | 1 | 131 | 158 | 82 | 109 | |
| UC 203 x 203 x 52 | 52,0 | 5256 | 509,8 | 567,0 | 8,9 | 18,66 | 1777 | 174,0 | 264,2 | 5,1 | 4,4 | 31,66 | 166,6 | 1 | 2 | 1 | 2 | 150 | 181 | 93 | 124 | |
| UC 203 x 203 x 46 | 46,1 | 4565 | 449,3 | 497,1 | 8,8 | 16,89 | 1548 | 152,0 | 230,8 | 5,1 | 4,0 | 22,07 | 142,8 | 2 | 3 | 2 | 3 | 168 | 203 | 104 | 139 | |
| UC 152 x 152 x 51 | 51,0 | 3229 | 379,5 | 438,4 | 7,0 | 20,05 | 1022 | 129,8 | 199,0 | 3,9 | 5,1 | 49,08 | 60,89 | 1 | 1 | 1 | 1 | 119 | 143 | 76 | 100 | |
| UC 152 x 152 x 44 | 44,0 | 2705 | 325,9 | 372,5 | 6,9 | 17,20 | 860,1 | 110,3 | 168,7 | 3,9 | 4,6 | 31,88 | 49,86 | 1 | 1 | 1 | 1 | 137 | 164 | 87 | 115 | |
| UC 152 x 152 x 37 | 37,0 | 2212 | 273,5 | 309,1 | 6,8 | 14,41 | 706,2 | 91,48 | 139,6 | 3,8 | 4,0 | 19,30 | 39,84 | 1 | 1 | 1 | 1 | 161 | 193 | 101 | 134 | |
| UC 152 x 152 x 30 | 30,0 | 1750 | 222,1 | 248,0 | 6,7 | 11,68 | 560,4 | 73,31 | 111,6 | 3,8 | 3,4 | 10,60 | 30,74 | 1 | 2 | 1 | 2 | 195 | 235 | 122 | 162 | |
| UC 152 x 152 x 23 | 23,0 | 1252 | 164,3 | 182,3 | 6,5 | 10,08 | 399,9 | 52,55 | 80,18 | 3,6 | 2,8 | 4,693 | 21,17 | 3 | 3 | 3 | 3 | 251 | 303 | 156 | 208 | |

Taper flange I sections

Flange slope: 14% - Dimensions: EN 10365:2017

Tolerances: EN 10024:1995

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles I de alas inclinadas

Inclinación de las alas: 14% - Dimensiones: EN 10365:2017

Tolerancias: EN 10024:1995.

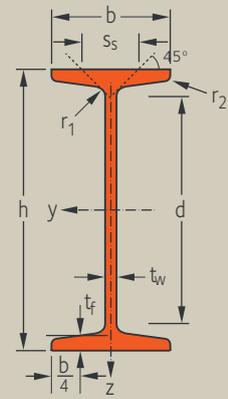
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Kształtowniki ze zbieżnymi stopkami

Pochylenie półek: 14% - Wymiary: EN 10365:2017

Tolerancje: EN 10024:1995

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | | |
|---|--------------------------------------|---------|---------|----------------------|----------------------|----------------------|----------------------|---------------------------------------|----------------------|-------------------------------------|---|-------------|---|----|----------|-----------------|---|----|--------|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | r ₁ mm | r ₂ mm | d mm | A cm ² | A _L m ² /m | A _C m ² /t | S355 | | | | S460 | | | |
| | | | | | | | | | | | | JR/J0/J2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | M | ML | 16 Mo3 |
| IPN 600 | 199 | 600,0 | 215,0 | 21,6 | 32,4 | 21,6 | 13,0 | 485,8 | 253,7 | 1,920 | 9,890 | ✓ | ✓ | - | ✓ | - | ✓ | - | - |
| IPN 550 | 166 | 550,0 | 200,0 | 19,0 | 30,0 | 19,0 | 11,9 | 445,6 | 212,0 | 1,800 | 10,80 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 500 | 141 | 500,0 | 185,0 | 18,0 | 27,0 | 18,0 | 10,8 | 404,3 | 179,4 | 1,630 | 11,60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 450 | 115 | 450,0 | 170,0 | 16,2 | 24,3 | 16,2 | 9,7 | 363,6 | 146,9 | 1,480 | 12,83 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 400 | 92,4 | 400,0 | 155,0 | 14,4 | 21,6 | 14,4 | 8,6 | 322,9 | 117,7 | 1,330 | 14,36 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 380 | 84,0 | 380,0 | 149,0 | 13,7 | 20,5 | 13,7 | 8,2 | 306,7 | 107,0 | 1,270 | 15,12 | ✓ | ✓ | - | ✓ | - | ✓ | - | - |
| IPN 360 | 76,1 | 360,0 | 143,0 | 13,0 | 19,5 | 13,0 | 7,8 | 290,2 | 97,0 | 1,210 | 15,89 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 340 | 68,0 | 340,0 | 137,0 | 12,2 | 18,3 | 12,2 | 7,3 | 274,3 | 86,7 | 1,150 | 16,90 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 320 | 61,0 | 320,0 | 131,0 | 11,5 | 17,3 | 11,5 | 6,9 | 257,9 | 77,7 | 1,090 | 17,87 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 300 | 54,2 | 300,0 | 125,0 | 10,8 | 16,2 | 10,8 | 6,5 | 241,6 | 69,0 | 1,030 | 19,02 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 280 | 47,9 | 280,0 | 119,0 | 10,1 | 15,2 | 10,1 | 6,1 | 225,1 | 61,0 | 0,966 | 20,17 | ✓ | ✓ | - | ✓ | - | ✓ | - | - |
| IPN 260 | 41,9 | 260,0 | 113,0 | 9,4 | 14,1 | 9,4 | 5,6 | 208,9 | 53,3 | 0,906 | 21,65 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 240 | 36,2 | 240,0 | 106,0 | 8,7 | 13,1 | 8,7 | 5,2 | 192,5 | 46,1 | 0,844 | 23,32 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 220 | 31,1 | 220,0 | 98,0 | 8,1 | 12,2 | 8,1 | 4,9 | 175,8 | 39,5 | 0,775 | 24,99 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 200 | 26,2 | 200,0 | 90,0 | 7,5 | 11,3 | 7,5 | 4,5 | 159,1 | 33,4 | 0,709 | 27,04 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 180 | 21,9 | 180,0 | 82,0 | 6,9 | 10,4 | 6,9 | 4,1 | 142,4 | 27,9 | 0,640 | 29,22 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 160 | 17,9 | 160,0 | 74,0 | 6,3 | 9,5 | 6,3 | 3,8 | 125,8 | 22,8 | 0,575 | 32,13 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 140 | 14,3 | 140,0 | 66,0 | 5,7 | 8,6 | 5,7 | 3,4 | 109,1 | 18,2 | 0,502 | 34,94 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 120 | 11,1 | 120,0 | 58,0 | 5,1 | 7,7 | 5,1 | 3,1 | 92,4 | 14,2 | 0,439 | 39,38 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 100 | 8,3 | 100,0 | 50,0 | 4,5 | 6,8 | 4,5 | 2,7 | 75,7 | 10,6 | 0,370 | 44,47 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| IPN 80 | 5,9 | 80,0 | 42,0 | 3,9 | 5,9 | 3,9 | 2,3 | 59,0 | 7,6 | 0,304 | 51,09 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | | |
|---|---|-----------------|-----------|-----------------|-----------------|-----------------|---|-----------|-------|-----------------|-----------------|-------|------------------------------------|---|---------------------|---|--|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | | | | | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| kg/m | cm ⁴ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | | |
| IPN 600 | 199 | 139000 | 4630 | 5452 | 23,4 | 138,0 | 4670 | 434,0 | 752,0 | 4,3 | 11,8 | 787,0 | 3814 | 1 | 1 | 1 | 1 | 67 | 76 | 56 | 64 |
| IPN 550 | 166 | 99180 | 3610 | 4240 | 21,6 | 111,3 | 3490 | 349,0 | 592,0 | 4,0 | 10,7 | 544,0 | 2390 | 1 | 1 | 1 | 1 | 74 | 84 | 61 | 71 |
| IPN 500 | 141 | 68740 | 2750 | 3240 | 19,6 | 95,60 | 2480 | 268,0 | 456,0 | 3,7 | 9,9 | 402,0 | 1400 | 1 | 1 | 1 | 1 | 80 | 91 | 66 | 76 |
| IPN 450 | 115 | 45850 | 2040 | 2400 | 17,7 | 77,79 | 1730 | 203,0 | 345,0 | 3,4 | 8,9 | 267,0 | 791,0 | 1 | 1 | 1 | 1 | 89 | 100 | 73 | 84 |
| IPN 400 | 92,4 | 29210 | 1460 | 1714 | 15,7 | 61,69 | 1160 | 149,0 | 253,0 | 3,1 | 7,9 | 170,0 | 420,0 | 1 | 1 | 1 | 1 | 99 | 113 | 81 | 94 |
| IPN 380 | 84,0 | 24010 | 1260 | 1482 | 15,0 | 55,55 | 975,0 | 131,0 | 221,0 | 3,0 | 7,5 | 141,0 | 319,0 | 1 | 1 | 1 | 1 | 104 | 118 | 85 | 99 |
| IPN 360 | 76,1 | 19610 | 1090 | 1276 | 14,2 | 49,95 | 818,0 | 114,0 | 194,0 | 2,9 | 7,2 | 115,0 | 240,0 | 1 | 1 | 1 | 1 | 110 | 124 | 89 | 104 |
| IPN 340 | 68,0 | 15700 | 923,0 | 1080 | 13,5 | 44,27 | 674,0 | 98,40 | 166,0 | 2,8 | 6,8 | 90,40 | 176,0 | 1 | 1 | 1 | 1 | 117 | 132 | 94 | 110 |
| IPN 320 | 61,0 | 12510 | 782,0 | 914,0 | 12,7 | 39,26 | 555,0 | 84,70 | 143,0 | 2,7 | 6,4 | 72,50 | 129,0 | 1 | 1 | 1 | 1 | 123 | 140 | 99 | 116 |
| IPN 300 | 54,2 | 9800 | 653,0 | 762,0 | 11,9 | 34,58 | 451,0 | 72,20 | 121,0 | 2,6 | 6,0 | 56,80 | 91,80 | 1 | 1 | 1 | 1 | 131 | 149 | 105 | 123 |
| IPN 280 | 47,9 | 7590 | 542,0 | 632,0 | 11,1 | 30,18 | 364,0 | 61,20 | 103,0 | 2,5 | 5,6 | 44,20 | 64,60 | 1 | 1 | 1 | 1 | 139 | 159 | 111 | 131 |
| IPN 260 | 41,9 | 5740 | 442,0 | 514,0 | 10,4 | 26,08 | 288,0 | 51,00 | 85,90 | 2,3 | 5,3 | 33,50 | 44,10 | 1 | 1 | 1 | 1 | 149 | 170 | 119 | 140 |
| IPN 240 | 36,2 | 4250 | 354,0 | 412,0 | 9,6 | 22,33 | 221,0 | 41,70 | 70,00 | 2,2 | 4,9 | 25,00 | 28,70 | 1 | 1 | 1 | 1 | 160 | 183 | 127 | 150 |
| IPN 220 | 31,1 | 3060 | 278,0 | 324,0 | 8,8 | 19,06 | 162,0 | 33,10 | 55,70 | 2,0 | 4,5 | 18,60 | 17,80 | 1 | 1 | 1 | 1 | 172 | 197 | 136 | 161 |
| IPN 200 | 26,2 | 2140 | 214,0 | 250,0 | 8,0 | 16,03 | 117,0 | 26,00 | 43,50 | 1,9 | 4,2 | 13,50 | 10,50 | 1 | 1 | 1 | 1 | 185 | 212 | 147 | 173 |
| IPN 180 | 21,9 | 1450 | 161,0 | 187,0 | 7,2 | 13,35 | 81,30 | 19,80 | 33,20 | 1,7 | 3,9 | 9,580 | 5,920 | 1 | 1 | 1 | 1 | 201 | 230 | 159 | 188 |
| IPN 160 | 17,9 | 935,0 | 117,0 | 136,0 | 6,4 | 10,83 | 54,70 | 14,80 | 24,90 | 1,6 | 3,5 | 6,570 | 3,140 | 1 | 1 | 1 | 1 | 219 | 251 | 173 | 205 |
| IPN 140 | 14,3 | 573,0 | 81,90 | 95,40 | 5,6 | 8,650 | 35,20 | 10,70 | 17,90 | 1,4 | 3,2 | 4,320 | 1,540 | 1 | 1 | 1 | 1 | 241 | 277 | 190 | 226 |
| IPN 120 | 11,1 | 328,0 | 54,70 | 63,60 | 4,8 | 6,630 | 21,50 | 7,410 | 12,40 | 1,2 | 2,8 | 2,710 | 0,690 | 1 | 1 | 1 | 1 | 268 | 309 | 210 | 251 |
| IPN 100 | 8,3 | 171,0 | 34,20 | 39,80 | 4,0 | 4,850 | 12,20 | 4,880 | 8,100 | 1,1 | 2,5 | 1,600 | 0,270 | 1 | 1 | 1 | 1 | 301 | 349 | 235 | 282 |
| IPN 80 | 5,9 | 77,80 | 19,50 | 22,80 | 3,2 | 3,410 | 6,290 | 3,000 | 5,000 | 0,9 | 2,2 | 0,870 | 0,090 | 1 | 1 | 1 | 1 | 344 | 400 | 267 | 322 |

Taper flange I sections

Dimensions: EN 10365:2017

Tolerances: EN 10034:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles I de alas inclinadas

Inclinación de alas: 14% - Dimensiones: EN 10365:2017

Tolerancias: EN 10024:1995.

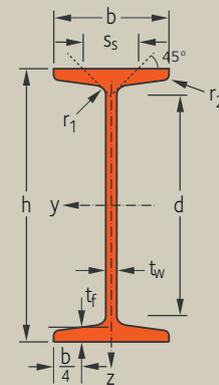
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Kształtowniki ze zbieżnymi stopkami

Pochylenie półek: 14% - Wymiary: EN 10365:2017

Tolerancje: EN 10024:1995

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | |
|---|--------------------------------------|-------|----------------|----------------|----------------|----------------|-----|-----------------|---------------------------------------|-------------------|-------------|---|---|---|
| | h | b | t _w | t _f | r ₁ | r ₂ | d | A | A _L | A _G | S355 | S460 | | |
| G kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | ≧ | ≧ | |
| J 152 x 127 x 37 ☎ | 37,3 | 152,4 | 127 | 10,4 | 13,2 | 13,5 | 6,6 | 96,0 | 46,9 | 0,770 | 20,80 | ✓ | ✓ | ✓ |
| J 127 x 114 x 29 ☎ | 29,3 | 127,0 | 114,3 | 10,2 | 11,5 | 9,9 | 4,8 | 81,0 | 36,8 | 0,670 | 23,10 | ✓ | ✓ | ✓ |
| J 127 x 114 x 27 ☎ | 26,9 | 127,0 | 114,3 | 7,4 | 11,4 | 9,9 | 5,0 | 81,0 | 33,8 | 0,670 | 25,32 | ✓ | ✓ | ✓ |
| J 127 x 76 x 16 ☎ | 16,5 | 127,0 | 76,2 | 5,6 | 9,6 | 9,4 | 4,6 | 87,0 | 20,9 | 0,530 | 32,39 | ✓ | ✓ | ✓ |
| J 114 x 114 x 27 ☎ | 26,9 | 114,3 | 114,3 | 9,5 | 10,7 | 14,2 | 3,2 | 60,0 | 33,9 | 0,640 | 24,14 | ✓ | ✓ | ✓ |
| J 102 x 102 x 23 ☎ | 23,0 | 101,6 | 101,6 | 9,5 | 10,3 | 11,1 | 3,2 | 57,0 | 28,8 | 0,570 | 25,22 | ✓ | ✓ | ✓ |
| J 102 x 44 x 7 ☎ | 7,5 | 101,6 | 44,5 | 4,3 | 6,1 | 6,9 | 3,3 | 75,0 | 9,4 | 0,360 | 49,11 | ✓ | ✓ | ✓ |
| J 89 x 89 x 19 ☎ | 19,5 | 88,9 | 88,9 | 9,5 | 9,9 | 11,1 | 3,2 | 45,0 | 24,4 | 0,500 | 25,92 | ✓ | ✓ | ✓ |
| J 76 x 76 x 15 ☎ | 15,0 | 76,2 | 80,0 | 8,9 | 8,4 | 9,4 | 4,6 | 39,0 | 18,8 | 0,440 | 29,65 | ✓ | ✓ | ✓ |
| J 76 x 76 x 13 ☎ | 12,8 | 76,2 | 76,2 | 5,1 | 8,4 | 9,4 | 4,6 | 39,0 | 16,1 | 0,430 | 34,12 | ✓ | ✓ | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-----------------|------------------------|------------------------------------|-----------------------|----------------------|------|--|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure Bending y-y | Pure Compression | Contour encasement | Hollow encasement | | | | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | | | | | | | | | |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | x10 ³ | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| J 152 x 127 x 37 | 37,3 | 1802 | 237,0 | 274,0 | 6,2 | 19,20 | 382,0 | 60,10 | 100,0 | 2,9 | 5,6 | 33,60 | 18,90 | 1 | 1 | 1 | 1 | 131 | 158 | 93 | 120 |
| J 127 x 114 x 29 | 29,3 | 968,0 | 152,0 | 177,0 | 5,1 | 14,59 | 243,0 | 42,60 | 70,80 | 2,6 | 4,8 | 20,60 | 8,210 | 1 | 1 | 1 | 1 | 145 | 176 | 101 | 132 |
| J 127 x 114 x 27 | 26,9 | 940,0 | 148,0 | 169,0 | 5,3 | 11,46 | 240,0 | 42,00 | 69,00 | 2,7 | 4,5 | 15,80 | 8,130 | 1 | 1 | 1 | 1 | 159 | 193 | 109 | 143 |
| J 127 x 76 x 16 | 16,5 | 568,0 | 89,50 | 103,0 | 5,2 | 8,950 | 61,50 | 16,10 | 26,70 | 1,7 | 3,7 | 6,440 | 2,170 | 1 | 1 | 1 | 1 | 209 | 246 | 159 | 195 |
| J 114 x 114 x 27 | 26,9 | 729,0 | 128,0 | 148,0 | 4,6 | 14,68 | 218,0 | 38,10 | 65,00 | 2,5 | 5,1 | 21,20 | 6,060 | 1 | 1 | 1 | 1 | 148 | 182 | 102 | 136 |
| J 102 x 102 x 23 | 23,0 | 479,0 | 94,30 | 111,0 | 4,1 | 11,71 | 152,0 | 29,90 | 50,10 | 2,3 | 4,5 | 14,90 | 3,230 | 1 | 1 | 1 | 1 | 156 | 191 | 107 | 142 |
| J 102 x 44 x 7 | 7,5 | 152,0 | 29,90 | 35,00 | 4,0 | 5,240 | 7,820 | 3,520 | 6,040 | 0,9 | 2,5 | 1,290 | 0,180 | 1 | 1 | 1 | 1 | 325 | 373 | 264 | 312 |
| J 89 x 89 x 19 | 19,5 | 303,0 | 68,10 | 80,80 | 3,5 | 10,43 | 98,90 | 22,20 | 37,40 | 2,0 | 4,4 | 12,70 | 1,580 | 1 | 1 | 1 | 1 | 159 | 195 | 110 | 147 |
| J 76 x 76 x 15 | 15,0 | 171,0 | 44,80 | 53,10 | 3,0 | 8,120 | 60,80 | 15,20 | 25,60 | 1,8 | 3,8 | 7,730 | 0,710 | 1 | 1 | 1 | 1 | 181 | 224 | 124 | 167 |
| J 76 x 76 x 13 | 12,8 | 158,0 | 41,40 | 48,10 | 3,1 | 5,650 | 52,50 | 13,80 | 22,70 | 1,8 | 3,5 | 4,390 | 0,620 | 1 | 1 | 1 | 1 | 210 | 257 | 143 | 191 |

Parallel flange channels

Dimensions: EN 10365:2017

Tolerances: EN 10279:2000

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles en U con alas paralelas

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

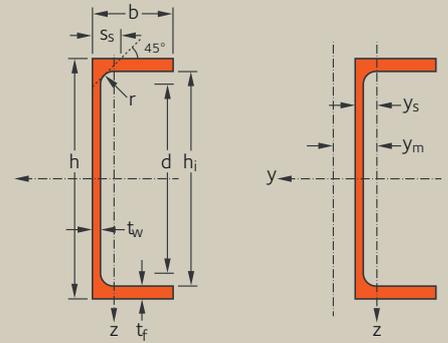
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Ceowniki o stopkach równoległych

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | |
|---|--------------------------------------|-------|----------------|----------------|------|----------------|-------|---------------------------------------|-------------------|-------------------|---|---|----|----------|-----------------|--------|--------|---|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _C | S355 | | | | | | | |
| G kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/IO/I2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | S460 M | 16.Mo3 | |
| UPE 400 | 72,2 | 400,0 | 115,0 | 13,5 | 18,0 | 18,0 | 364,0 | 328,0 | 91,9 | 1,218 | 16,87 | ✓ | ✓ | - | - | - | ✓ | - |
| UPE 360 | 61,2 | 360,0 | 110,0 | 12,0 | 17,0 | 18,0 | 326,0 | 290,0 | 77,9 | 1,121 | 18,32 | ✓ | ✓ | - | - | - | ✓ | - |
| UPE 330 | 53,2 | 330,0 | 105,0 | 11,0 | 16,0 | 18,0 | 298,0 | 262,0 | 67,8 | 1,043 | 19,60 | ✓ | ✓ | - | - | - | ✓ | - |
| UPE 300 | 44,4 | 300,0 | 100,0 | 9,5 | 15,0 | 15,0 | 270,0 | 240,0 | 56,6 | 0,968 | 21,78 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 270 | 35,2 | 270,0 | 95,0 | 7,5 | 13,5 | 15,0 | 243,0 | 213,0 | 44,8 | 0,892 | 25,34 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 240 | 30,2 | 240,0 | 90,0 | 7,0 | 12,5 | 15,0 | 215,0 | 185,0 | 38,5 | 0,813 | 26,89 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 220 | 26,6 | 220,0 | 85,0 | 6,5 | 12,0 | 13,0 | 196,0 | 170,0 | 33,9 | 0,756 | 28,43 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 200 | 22,8 | 200,0 | 80,0 | 6,0 | 11,0 | 13,0 | 178,0 | 152,0 | 29,0 | 0,697 | 30,60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 180 | 19,7 | 180,0 | 75,0 | 5,5 | 10,5 | 12,0 | 159,0 | 135,0 | 25,1 | 0,639 | 32,40 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 160 | 17,0 | 160,0 | 70,0 | 5,5 | 9,5 | 12,0 | 141,0 | 117,0 | 21,7 | 0,579 | 34,01 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 140 | 14,5 | 140,0 | 65,0 | 5,0 | 9,0 | 12,0 | 122,0 | 98,0 | 18,4 | 0,520 | 35,95 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 120 | 12,1 | 120,0 | 60,0 | 5,0 | 8,0 | 12,0 | 104,0 | 80,0 | 15,4 | 0,460 | 37,98 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 100 | 9,8 | 100,0 | 55,0 | 4,5 | 7,5 | 10,0 | 85,0 | 65,0 | 12,5 | 0,402 | 41,00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPE 80 | 7,9 | 80,0 | 50,0 | 4,0 | 7,0 | 10,0 | 66,0 | 46,0 | 10,1 | 0,343 | 43,45 | ✓ | ✓ | - | - | - | ✓ | - |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | |
|---|---|------------------|------------------|----------------|-----------------|---|------------------|------------------|----------------|----------------|-----------------|-----------------|----------------|----------------|-----|------------------------------------|---|---------------------|----------------------|---|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | weak axis z-z eje débil z-z oś z-z (wiatka) | | | | | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | |
| | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | y _s | y _m | | | | | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | cm | cm | | | | | | | | | |
| UPE 400 | 72,2 | 20980 | 1050 | 1260 | 15,1 | 56,20 | 1045 | 123,0 | 220,8 | 3,4 | 4,2 | 79,10 | 259,0 | 3,0 | 6,1 | 1 | 1 | 1 | 2 | 120 | 132 | 100 | 112 |
| UPE 360 | 61,2 | 14830 | 824,0 | 982,0 | 13,8 | 45,60 | 844,0 | 105,0 | 189,2 | 3,3 | 4,0 | 58,50 | 166,0 | 3,0 | 6,1 | 1 | 1 | 1 | 2 | 130 | 144 | 107 | 121 |
| UPE 330 | 53,2 | 11010 | 667,0 | 792,0 | 12,7 | 38,80 | 681,0 | 89,70 | 161,7 | 3,2 | 3,8 | 45,20 | 112,0 | 2,9 | 6,0 | 1 | 1 | 1 | 2 | 138 | 154 | 113 | 128 |
| UPE 300 | 44,4 | 7820 | 522,0 | 613,0 | 11,8 | 30,30 | 538,0 | 75,60 | 140,1 | 3,1 | 3,3 | 31,50 | 72,70 | 2,9 | 6,0 | 1 | 1 | 1 | 2 | 153 | 171 | 124 | 141 |
| UPE 270 | 35,2 | 5250 | 389,0 | 451,0 | 10,8 | 22,20 | 401,0 | 60,70 | 110,2 | 3,0 | 3,0 | 19,90 | 43,60 | 2,9 | 6,1 | 1 | 1 | 2 | 3 | 178 | 199 | 142 | 163 |
| UPE 240 | 30,2 | 3600 | 300,0 | 347,0 | 9,7 | 18,80 | 311,0 | 50,10 | 90,84 | 2,8 | 2,8 | 15,10 | 26,40 | 2,8 | 5,9 | 1 | 1 | 1 | 2 | 188 | 211 | 148 | 171 |
| UPE 220 | 26,6 | 2680 | 244,0 | 281,0 | 8,9 | 15,80 | 247,0 | 42,50 | 76,88 | 2,7 | 2,6 | 12,10 | 17,60 | 2,7 | 5,7 | 1 | 1 | 1 | 2 | 198 | 223 | 155 | 180 |
| UPE 200 | 22,8 | 1910 | 191,0 | 220,0 | 8,1 | 13,50 | 187,0 | 34,50 | 62,20 | 2,5 | 2,5 | 8,890 | 11,00 | 2,6 | 5,4 | 1 | 1 | 1 | 2 | 213 | 240 | 165 | 193 |
| UPE 180 | 19,7 | 1350 | 150,0 | 173,0 | 7,3 | 11,20 | 144,0 | 28,60 | 51,47 | 2,4 | 2,3 | 6,990 | 6,810 | 2,5 | 5,2 | 1 | 1 | 1 | 2 | 224 | 254 | 173 | 203 |
| UPE 160 | 17,0 | 911,0 | 114,0 | 132,0 | 6,5 | 10,00 | 107,0 | 22,60 | 40,72 | 2,2 | 2,2 | 5,200 | 3,960 | 2,3 | 4,8 | 1 | 1 | 1 | 1 | 235 | 267 | 180 | 212 |
| UPE 140 | 14,5 | 600,0 | 85,60 | 98,80 | 5,7 | 8,250 | 78,80 | 18,20 | 32,58 | 2,1 | 2,1 | 4,050 | 2,200 | 2,2 | 4,5 | 1 | 1 | 1 | 1 | 247 | 282 | 187 | 223 |
| UPE 120 | 12,1 | 364,0 | 60,60 | 70,30 | 4,9 | 7,180 | 55,50 | 13,80 | 24,80 | 1,9 | 2,0 | 2,900 | 1,120 | 2,0 | 4,1 | 1 | 1 | 1 | 1 | 259 | 298 | 195 | 233 |
| UPE 100 | 9,8 | 207,0 | 41,40 | 48,00 | 4,1 | 5,340 | 38,30 | 10,60 | 18,88 | 1,8 | 1,8 | 2,010 | 0,530 | 1,9 | 3,9 | 1 | 1 | 1 | 1 | 278 | 322 | 204 | 248 |
| UPE 80 | 7,9 | 107,0 | 26,80 | 31,20 | 3,3 | 4,050 | 25,50 | 8,000 | 13,94 | 1,6 | 1,7 | 1,470 | 0,220 | 1,8 | 3,7 | 1 | 1 | 1 | 1 | 291 | 341 | 209 | 258 |

Parallel flange channels

Dimensions: EN 10365:2017

Tolerances: EN 10279:2000

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles en U con alas paralelas

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

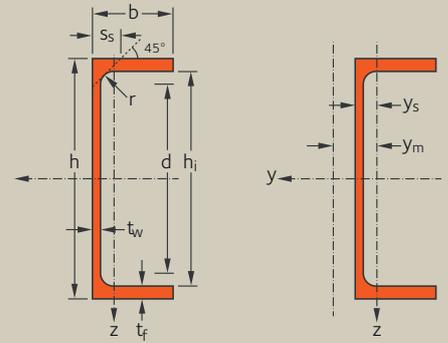
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Ceowniki równoległocienne

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | |
|---|--------------------------------------|-------|----------------|----------------|------|----------------|-------|-----------------|---------------------------------------|-------------------|-------------|---|--------|---|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _G | S355 | | S460 M | |
| G kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | | |
| PFC 430 x 100 x 64 | 64,4 | 430,0 | 100,0 | 11,0 | 19,0 | 15,0 | 392,0 | 362,0 | 82,1 | 1,225 | 19,01 | ✓ | ✓ | ✓ |
| PFC 380 x 100 x 54 | 54,0 | 380,0 | 100,0 | 9,5 | 17,5 | 15,0 | 345,0 | 315,0 | 68,7 | 1,128 | 20,91 | ✓ | ✓ | ✓ |
| PFC 300 x 100 x 46 | 45,5 | 300,0 | 100,0 | 9,0 | 16,5 | 15,0 | 267,0 | 237,0 | 58,0 | 0,969 | 21,29 | ✓ | ✓ | ✓ |
| PFC 300 x 90 x 41 | 41,4 | 300,0 | 90,0 | 9,0 | 15,5 | 12,0 | 269,0 | 245,0 | 52,7 | 0,932 | 22,51 | ✓ | ✓ | ✓ |
| PFC 260 x 90 x 35 | 34,8 | 260,0 | 90,0 | 8,0 | 14,0 | 12,0 | 232,0 | 208,0 | 44,4 | 0,854 | 24,51 | ✓ | ✓ | ✓ |
| PFC 260 x 75 x 28 | 27,6 | 260,0 | 75,0 | 7,0 | 12,0 | 12,0 | 236,0 | 212,0 | 35,1 | 0,796 | 28,85 | ✓ | ✓ | ✓ |
| PFC 230 x 90 x 32 | 32,2 | 230,0 | 90,0 | 7,5 | 14,0 | 12,0 | 202,0 | 178,0 | 41,0 | 0,795 | 24,71 | ✓ | ✓ | ✓ |
| PFC 230 x 75 x 26 | 25,7 | 230,0 | 75,0 | 6,5 | 12,5 | 12,0 | 205,0 | 181,0 | 32,7 | 0,737 | 28,71 | ✓ | ✓ | ✓ |
| PFC 200 x 90 x 30 | 29,7 | 200,0 | 90,0 | 7,0 | 14,0 | 12,0 | 172,0 | 148,0 | 37,9 | 0,736 | 24,76 | ✓ | ✓ | ✓ |
| PFC 200 x 75 x 23 | 23,4 | 200,0 | 75,0 | 6,0 | 12,5 | 12,0 | 175,0 | 151,0 | 29,9 | 0,678 | 28,90 | ✓ | ✓ | ✓ |
| PFC 180 x 90 x 26 | 26,1 | 180,0 | 90,0 | 6,5 | 12,5 | 12,0 | 155,0 | 131,0 | 33,2 | 0,697 | 26,74 | ✓ | ✓ | ✓ |
| PFC 180 x 75 x 20 | 20,3 | 180,0 | 75,0 | 6,0 | 10,5 | 12,0 | 159,0 | 135,0 | 25,9 | 0,638 | 31,36 | ✓ | ✓ | ✓ |
| PFC 150 x 90 x 24 | 23,9 | 150,0 | 90,0 | 6,5 | 12,0 | 12,0 | 126,0 | 102,0 | 30,4 | 0,637 | 26,67 | ✓ | ✓ | ✓ |
| PFC 150 x 75 x 18 | 17,9 | 150,0 | 75,0 | 5,5 | 10,0 | 12,0 | 130,0 | 106,0 | 22,8 | 0,579 | 32,38 | ✓ | ✓ | ✓ |
| PFC 125 x 65 x 15 | 14,8 | 125,0 | 65,0 | 5,5 | 9,5 | 12,0 | 106,0 | 82,0 | 18,8 | 0,489 | 33,12 | ✓ | ✓ | ✓ |
| PFC 100 x 50 x 10 | 10,2 | 100,0 | 50,0 | 5,0 | 8,5 | 9,0 | 83,0 | 65,0 | 13,0 | 0,382 | 37,47 | ✓ | ✓ | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | | |
|---|---|------------------|------------------|----------------|-----------------|-----------------|---|------------------|----------------|----------------|------------------|-----------------|----------------|----------------|------------------------------------|------|---------------------|------|---|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiatka) | | | | | | | | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | | |
| | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | y _s | y _m | S355 | S460 | S355 | S460 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | cm | cm | | | | | | | | | |
| | | | | | | | | | | | x10 ³ | | | | | | | | | | | | |
| PFC 430 x 100 x 64 | 64,4 | 21940 | 1020 | 1222 | 16,4 | 49,03 | 722,5 | 97,90 | 175,9 | 3,0 | 3,9 | 63,00 | 207,8 | 2,6 | 5,4 | 1 | 1 | 3 | 4 | 137 | 149 | 117 | 129 |
| PFC 380 x 100 x 54 | 54,0 | 15030 | 791,3 | 933,4 | 14,8 | 38,03 | 643,0 | 89,18 | 160,7 | 3,1 | 3,6 | 45,66 | 141,8 | 2,8 | 5,9 | 1 | 1 | 3 | 4 | 150 | 164 | 125 | 140 |
| PFC 300 x 100 x 46 | 45,5 | 8229 | 548,6 | 640,7 | 11,9 | 28,96 | 567,8 | 81,72 | 148,3 | 3,1 | 3,4 | 36,84 | 75,70 | 3,1 | 6,4 | 1 | 1 | 1 | 2 | 150 | 167 | 121 | 138 |
| PFC 300 x 90 x 41 | 41,4 | 7218 | 481,2 | 567,8 | 11,7 | 28,08 | 403,9 | 63,12 | 114,0 | 2,8 | 3,2 | 28,77 | 54,80 | 2,6 | 5,4 | 1 | 1 | 2 | 3 | 160 | 177 | 131 | 148 |
| PFC 260 x 90 x 35 | 34,8 | 4728 | 363,7 | 424,6 | 10,3 | 21,98 | 352,5 | 56,29 | 102,2 | 2,8 | 2,9 | 20,57 | 35,55 | 2,7 | 5,7 | 1 | 1 | 1 | 2 | 172 | 192 | 137 | 158 |
| PFC 260 x 75 x 28 | 27,6 | 3619 | 278,4 | 327,8 | 10,2 | 19,42 | 185,5 | 34,36 | 62,01 | 2,3 | 2,6 | 11,73 | 19,03 | 2,1 | 4,4 | 1 | 1 | 2 | 4 | 205 | 226 | 169 | 191 |
| PFC 230 x 90 x 32 | 32,2 | 3518 | 305,9 | 354,7 | 9,3 | 18,50 | 334,1 | 54,97 | 99,15 | 2,9 | 2,9 | 19,31 | 25,95 | 2,9 | 6,1 | 1 | 1 | 1 | 2 | 172 | 194 | 134 | 156 |
| PFC 230 x 75 x 26 | 25,7 | 2748 | 239,0 | 278,4 | 9,2 | 16,26 | 181,0 | 34,81 | 63,18 | 2,4 | 2,6 | 11,82 | 14,16 | 2,3 | 4,8 | 1 | 1 | 2 | 3 | 202 | 225 | 164 | 187 |
| PFC 200 x 90 x 30 | 29,7 | 2523 | 252,3 | 291,3 | 8,2 | 15,32 | 313,9 | 53,40 | 94,54 | 2,9 | 2,8 | 18,29 | 18,19 | 3,1 | 6,4 | 1 | 1 | 1 | 1 | 171 | 194 | 129 | 153 |
| PFC 200 x 75 x 23 | 23,4 | 1963 | 196,3 | 227,0 | 8,1 | 13,37 | 170,0 | 33,84 | 60,80 | 2,4 | 2,6 | 11,09 | 9,890 | 2,5 | 5,2 | 1 | 1 | 1 | 2 | 202 | 227 | 159 | 184 |
| PFC 180 x 90 x 26 | 26,1 | 1817 | 201,9 | 232,1 | 7,4 | 13,01 | 276,7 | 47,44 | 83,47 | 2,9 | 2,6 | 13,31 | 13,03 | 3,2 | 6,6 | 1 | 1 | 1 | 1 | 183 | 210 | 136 | 163 |
| PFC 180 x 75 x 20 | 20,3 | 1370 | 152,2 | 176,2 | 7,3 | 12,05 | 146,4 | 28,76 | 51,95 | 2,4 | 2,4 | 7,340 | 6,920 | 2,4 | 5,1 | 1 | 1 | 1 | 1 | 217 | 246 | 168 | 197 |
| PFC 150 x 90 x 24 | 23,9 | 1162 | 154,9 | 178,6 | 6,2 | 11,03 | 253,2 | 44,45 | 76,92 | 2,9 | 2,6 | 11,80 | 8,150 | 3,3 | 6,8 | 1 | 1 | 1 | 1 | 180 | 209 | 128 | 158 |
| PFC 150 x 75 x 18 | 17,9 | 861,0 | 114,8 | 132,1 | 6,2 | 9,520 | 131,0 | 26,61 | 47,24 | 2,4 | 2,3 | 6,100 | 4,240 | 2,6 | 5,4 | 1 | 1 | 1 | 1 | 221 | 254 | 165 | 198 |
| PFC 125 x 65 x 15 | 14,8 | 483,1 | 77,29 | 89,88 | 5,1 | 8,110 | 80,02 | 18,80 | 33,44 | 2,1 | 2,2 | 4,720 | 1,740 | 2,3 | 4,6 | 1 | 1 | 1 | 1 | 225 | 260 | 168 | 202 |
| PFC 100 x 50 x 10 | 10,2 | 207,7 | 41,54 | 48,87 | 4,0 | 5,690 | 32,30 | 9,890 | 17,61 | 1,6 | 1,9 | 2,530 | 0,440 | 1,7 | 3,5 | 1 | 1 | 1 | 1 | 256 | 294 | 192 | 231 |

Taper flange channels

Dimensions: EN 10365:2017

Tolerances: EN 10279:2000

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles en U con alas inclinadas

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

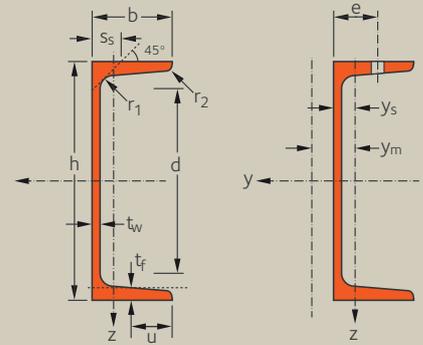
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Ceowniki ze zbieżnymi stopkami

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|-------|-------|------------|------|------|-----|-------|---------------------------------------|-------------------|-------------------|---|---|----|----------|-----------------|--------|--------|
| | G | h | b | tw | tf | r1 | r2 | d | A | AL | AG | S355 | | | | | | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | JR/J0/J2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | S460 M | 16 Mo3 |
| UPN 400 | 71,8 | 400,0 | 110,0 | 14,0 | 18,0 | 18,0 | 9,0 | 324,0 | 91,5 | 1,180 | 16,46 | ✓ | ✓ | - | - | - | ✓ | - |
| UPN 380 | 63,1 | 380,0 | 102,0 | 13,5 | 16,0 | 16,0 | 8,0 | 313,0 | 80,4 | 1,110 | 17,59 | ✓ | ✓ | - | - | - | ✓ | - |
| UPN 350 | 60,6 | 350,0 | 100,0 | 14,0 | 16,0 | 16,0 | 8,0 | 282,0 | 77,3 | 1,050 | 17,25 | ✓ | ✓ | - | - | - | ✓ | - |
| UPN 320 | 59,5 | 320,0 | 100,0 | 14,0 | 17,5 | 17,5 | 8,8 | 246,0 | 75,8 | 0,982 | 16,50 | ✓ | ✓ | - | - | - | ✓ | - |
| UPN 300 | 46,2 | 300,0 | 100,0 | 10,0 | 16,0 | 16,0 | 8,0 | 232,0 | 58,8 | 0,950 | 20,58 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 280 | 41,8 | 280,0 | 95,0 | r1 10,0 | 15,0 | 15,0 | 7,5 | 216,0 | 53,3 | 0,890 | 21,27 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 260 | 37,9 | 260,0 | 90,0 | 10,0 | 14,0 | 14,0 | 7,0 | 200,0 | 48,3 | 0,834 | 22,00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 240 | 33,2 | 240,0 | 85,0 | 9,5 | 13,0 | 13,0 | 6,5 | 184,0 | 42,3 | 0,775 | 23,34 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 220 | 29,4 | 220,0 | 80,0 | 9,0 | 12,5 | 12,5 | 6,5 | 167,0 | 37,4 | 0,718 | 24,46 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 200 | 25,3 | 200,0 | 75,0 | 8,5 | 11,5 | 11,5 | 6,0 | 151,0 | 32,2 | 0,661 | 26,15 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 180 | 22,0 | 180,0 | 70,0 | 8,0 | 11,0 | 11,0 | 5,5 | 133,0 | 28,0 | 0,611 | 27,80 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 160 | 18,8 | 160,0 | 65,0 | 7,5 | 10,5 | 10,5 | 5,5 | 115,0 | 24,0 | 0,546 | 28,98 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 140 | 16,0 | 140,0 | 60,0 | 7,0 | 10,0 | 10,0 | 5,0 | 98,0 | 20,4 | 0,489 | 30,54 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 120 | 13,4 | 120,0 | 55,0 | 7,0 | 9,0 | 9,0 | 4,5 | 82,0 | 17,0 | 0,434 | 32,52 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 100 | 10,6 | 100,0 | 50,0 | 6,0 | 8,5 | 8,5 | 4,5 | 64,0 | 13,5 | 0,372 | 35,10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 80 | 8,6 | 80,0 | 45,0 | 6,0 | 8,0 | 8,0 | 4,0 | 47,0 | 11,0 | 0,312 | 37,10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UPN 65 | 7,1 | 65,0 | 42,0 | 5,5 | 7,5 | 7,5 | 4,0 | 34,0 | 9,00 | 0,273 | 39,57 | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ |
| UPN 50 | 5,6 | 50,0 | 38,0 | 5,0 | 7,0 | 7,0 | 3,5 | 21,0 | 7,10 | 0,232 | 42,22 | ✓ | ✓ | ✓ | ✓ | - | ✓ | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | |
|---|---|------------------|------------------|----------------|-----------------|---|------------------|------------------|----------------|----------------|-----------------|-----------------|------------------------------------|----------------|----------------|------------------------------------|------------------------------------|---------------------|----------------|---|------|----------------------|------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | weak axis z-z eje débil z-z oś z-z (wiatka) | | | | | S _s | I _t | I _w x10 ³ | y _s | y _m | Pure Bending y-y | | Pure Compression | | Contour encasement | | Hollow encasement | |
| | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | | | | | | I _t | I _w x10 ³ | y _s | y _m | S355 | S460 | S355 | S460 |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | cm | cm | | | | | | | | | |
| UPN 400 | 71,8 | 20350 | 1020 | 1240 | 14,9 | 58,60 | 846,0 | 102,0 | 190,0 | 3,0 | 4,4 | 81,60 | 221,0 | 2,7 | 5,1 | 1 | 1 | 1 | 1 | 117 | 129 | 99 | 111 |
| UPN 380 | 63,1 | 15760 | 829,0 | 1010 | 14,0 | 53,20 | 615,0 | 78,70 | 148,0 | 2,8 | 4,0 | 59,10 | 146,0 | 2,4 | 4,6 | 1 | 1 | 1 | 1 | 126 | 139 | 107 | 120 |
| UPN 350 | 60,6 | 12840 | 734,0 | 918,0 | 12,9 | 50,80 | 570,0 | 75,00 | 143,0 | 2,7 | 4,1 | 61,20 | 114,0 | 2,4 | 4,5 | 1 | 1 | 1 | 1 | 122 | 135 | 104 | 117 |
| UPN 320 | 59,5 | 10870 | 679,0 | 826,0 | 12,1 | 47,10 | 597,0 | 80,60 | 152,0 | 2,8 | 4,3 | 66,70 | 96,10 | 2,6 | 4,8 | 1 | 1 | 1 | 1 | 117 | 130 | 98 | 111 |
| UPN 300 | 46,2 | 8030 | 535,0 | 632,0 | 11,7 | 31,80 | 495,0 | 67,80 | 130,0 | 2,9 | 3,7 | 37,40 | 69,10 | 2,7 | 5,4 | 1 | 1 | 1 | 1 | 144 | 162 | 119 | 136 |
| UPN 280 | 41,8 | 6280 | 448,0 | 532,0 | 10,9 | 29,30 | 399,0 | 57,20 | 109,0 | 2,7 | 3,6 | 31,00 | 48,50 | 2,5 | 5,0 | 1 | 1 | 1 | 1 | 149 | 167 | 123 | 140 |
| UPN 260 | 37,9 | 4820 | 371,0 | 442,0 | 10,0 | 27,10 | 317,0 | 47,70 | 91,60 | 2,6 | 3,4 | 25,50 | 33,30 | 2,4 | 4,7 | 1 | 1 | 1 | 1 | 154 | 172 | 126 | 145 |
| UPN 240 | 33,2 | 3600 | 300,0 | 358,0 | 9,2 | 23,70 | 248,0 | 39,60 | 75,70 | 2,4 | 3,2 | 19,70 | 22,10 | 2,2 | 4,4 | 1 | 1 | 1 | 1 | 163 | 183 | 134 | 154 |
| UPN 220 | 29,4 | 2690 | 245,0 | 292,0 | 8,5 | 20,60 | 197,0 | 33,60 | 64,10 | 2,3 | 3,0 | 16,00 | 14,60 | 2,1 | 4,2 | 1 | 1 | 1 | 1 | 170 | 192 | 139 | 160 |
| UPN 200 | 25,3 | 1910 | 191,0 | 228,0 | 7,7 | 17,70 | 148,0 | 27,00 | 51,80 | 2,1 | 2,8 | 11,90 | 9,070 | 2,0 | 3,9 | 1 | 1 | 1 | 1 | 182 | 205 | 148 | 171 |
| UPN 180 | 22,0 | 1350 | 150,0 | 179,0 | 7,0 | 15,10 | 114,0 | 22,40 | 42,90 | 2,0 | 2,7 | 9,550 | 5,570 | 1,9 | 3,8 | 1 | 1 | 1 | 1 | 190 | 216 | 154 | 179 |
| UPN 160 | 18,8 | 925,0 | 116,0 | 138,0 | 6,2 | 12,60 | 85,30 | 18,30 | 35,20 | 1,9 | 2,5 | 7,390 | 3,260 | 1,8 | 3,6 | 1 | 1 | 1 | 1 | 200 | 227 | 160 | 187 |
| UPN 140 | 16,0 | 605,0 | 86,40 | 103,0 | 5,5 | 10,40 | 62,70 | 14,80 | 28,30 | 1,8 | 2,4 | 5,680 | 1,800 | 1,8 | 3,4 | 1 | 1 | 1 | 1 | 210 | 239 | 167 | 196 |
| UPN 120 | 13,4 | 364,0 | 60,70 | 72,60 | 4,6 | 8,800 | 43,20 | 11,10 | 21,20 | 1,6 | 2,2 | 4,150 | 0,900 | 1,6 | 3,0 | 1 | 1 | 1 | 1 | 220 | 253 | 174 | 206 |
| UPN 100 | 10,6 | 206,0 | 41,20 | 49,00 | 3,9 | 6,460 | 29,30 | 8,490 | 16,20 | 1,5 | 2,0 | 2,810 | 0,410 | 1,6 | 2,9 | 1 | 1 | 1 | 1 | 239 | 277 | 186 | 223 |
| UPN 80 | 8,6 | 106,0 | 26,50 | 32,30 | 3,1 | 4,900 | 19,40 | 6,360 | 11,90 | 1,3 | 1,9 | 2,200 | 0,180 | 1,5 | 2,7 | 1 | 1 | 1 | 1 | 244 | 284 | 186 | 227 |
| UPN 65 | 7,1 | 57,50 | 17,70 | 21,70 | 2,5 | 3,680 | 14,10 | 5,070 | 9,380 | 1,3 | 1,8 | 1,610 | 0,080 | 1,4 | 2,6 | 1 | 1 | 1 | 1 | 256 | 302 | 190 | 237 |
| UPN 50 | 5,6 | 26,40 | 10,60 | 13,10 | 1,9 | 2,770 | 9,120 | 3,750 | 6,780 | 1,1 | 1,7 | 1,120 | 0,030 | 1,4 | 2,5 | 1 | 1 | 1 | 1 | 269 | 322 | 194 | 247 |

Equal leg angles ▼

Dimensions: EN 10056-1:2017

Tolerances: EN 10056-2:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles con angulares de lados iguales ▼

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

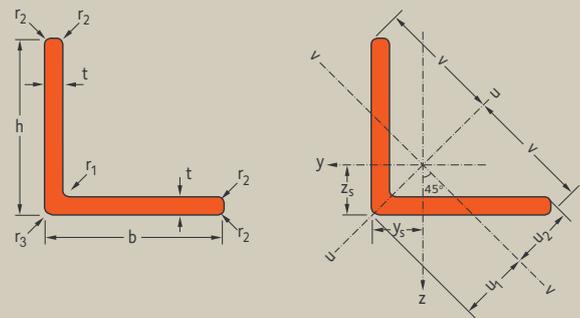
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Kątowniki równoramienne ▼

Wymiary: EN 10365: 2017

Tolerancje: EN 10034: 1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | Surface Superficie Powierzchnia | | | Position of axes Posición de los ejes Położenie osi | | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|-----|----|----------------|----------------|----------------|---------------------------------------|-------------------|-------------------|---|----|----------------|----------------|---|---|----|----------|-----------------|---------|--------|
| | G | h=b | t | r ₁ | r ₂ | r ₃ | A | A _L | A _C | z _s =y _s | v | u ₁ | u ₂ | S355 | | | | | | |
| kg/m | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | cm | cm | cm | cm | JR/J0/J2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | S 460 M | 16 Mo3 |

| | | | | | | | | | | | | | | | | | | | | |
|------------------|-----|-----|----|----|----|----|-------|-------|-------|------|-------|-------|-------|---|---|---|---|---|---|---|
| L 300 x 300 x 35 | 154 | 300 | 35 | 18 | 12 | 15 | 197,0 | 1,170 | 7,55 | 8,73 | 21,20 | 12,35 | 11,34 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 34 | 150 | 300 | 34 | 18 | 12 | 15 | 191,0 | 1,170 | 7,75 | 8,70 | 21,20 | 12,30 | 11,32 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 33 | 146 | 300 | 33 | 18 | 12 | 15 | 186,0 | 1,170 | 7,98 | 8,66 | 21,20 | 12,24 | 11,30 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 32 | 142 | 300 | 32 | 18 | 12 | 15 | 181,0 | 1,170 | 8,21 | 8,62 | 21,20 | 12,19 | 11,29 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 31 | 138 | 300 | 31 | 18 | 12 | 15 | 175,0 | 1,170 | 8,46 | 8,58 | 21,20 | 12,14 | 11,27 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 30 | 133 | 300 | 30 | 18 | 12 | 15 | 170,0 | 1,170 | 8,73 | 8,54 | 21,20 | 12,08 | 11,25 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 29 | 129 | 300 | 29 | 18 | 12 | 15 | 165,0 | 1,170 | 9,02 | 8,50 | 21,20 | 12,03 | 11,24 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 28 | 125 | 300 | 28 | 18 | 12 | 15 | 159,0 | 1,170 | 9,33 | 8,47 | 21,20 | 11,97 | 11,22 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 27 | 121 | 300 | 27 | 18 | 12 | 15 | 154,0 | 1,170 | 9,66 | 8,43 | 21,20 | 11,92 | 11,21 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 26 | 116 | 300 | 26 | 18 | 12 | 15 | 148,0 | 1,170 | 10,01 | 8,39 | 21,20 | 11,86 | 11,19 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 300 x 300 x 25 | 112 | 300 | 25 | 18 | 12 | 15 | 143,0 | 1,170 | 10,40 | 8,35 | 21,20 | 11,80 | 11,18 | ✓ | ✓ | - | ✓ | - | ✓ | - |

| | | | | | | | | | | | | | | | | | | | | |
|------------------|------|-----|----|----|---|---|-------|-------|-------|------|-------|-------|------|---|---|---|---|---|---|---|
| L 250 x 250 x 35 | 128 | 250 | 35 | 18 | 9 | 3 | 163,0 | 0,980 | 7,64 | 7,49 | 17,70 | 10,59 | 9,56 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 250 x 250 x 34 | 124 | 250 | 34 | 18 | 9 | 3 | 158,0 | 0,980 | 7,84 | 7,45 | 17,70 | 10,54 | 9,54 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 33 | 121 | 250 | 33 | 18 | 9 | 3 | 154,0 | 0,980 | 8,06 | 7,42 | 17,70 | 10,49 | 9,52 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 32 | 118 | 250 | 32 | 18 | 9 | 3 | 150,0 | 0,980 | 8,30 | 7,38 | 17,70 | 10,44 | 9,50 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 31 | 114 | 250 | 31 | 18 | 9 | 3 | 145,0 | 0,980 | 8,55 | 7,34 | 17,70 | 10,38 | 9,49 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 30 | 111 | 250 | 30 | 18 | 9 | 3 | 141,0 | 0,980 | 8,81 | 7,30 | 17,70 | 10,33 | 9,47 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 29 | 107 | 250 | 29 | 18 | 9 | 3 | 137,0 | 0,980 | 9,10 | 7,27 | 17,70 | 10,28 | 9,45 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 28 | 104 | 250 | 28 | 18 | 9 | 3 | 133,0 | 0,980 | 9,40 | 7,23 | 17,70 | 10,22 | 9,44 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 250 x 250 x 27 | 101 | 250 | 27 | 18 | 9 | 3 | 128,0 | 0,980 | 9,66 | 7,19 | 17,70 | 10,17 | 9,42 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 26 | 96,7 | 250 | 26 | 18 | 9 | 3 | 123,0 | 0,980 | 10,09 | 7,15 | 17,70 | 10,11 | 9,40 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 250 x 250 x 25 | 93,2 | 250 | 25 | 18 | 9 | 3 | 119,0 | 0,980 | 10,47 | 7,11 | 17,70 | 10,06 | 9,39 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 24 | 89,7 | 250 | 24 | 18 | 9 | 3 | 114,0 | 0,980 | 10,88 | 7,07 | 17,70 | 10,00 | 9,37 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 23 | 86,1 | 250 | 23 | 18 | 9 | 3 | 110,0 | 0,980 | 11,33 | 7,03 | 17,70 | 9,95 | 9,36 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 22 | 82,5 | 250 | 22 | 18 | 9 | 3 | 105,0 | 0,980 | 11,82 | 7,00 | 17,70 | 9,89 | 9,34 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 21 | 78,9 | 250 | 21 | 18 | 9 | 3 | 101,0 | 0,980 | 12,36 | 6,96 | 17,70 | 9,84 | 9,33 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 20 | 75,3 | 250 | 20 | 18 | 9 | 3 | 96,0 | 0,980 | 12,95 | 6,91 | 17,70 | 9,78 | 9,31 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 19 | 71,7 | 250 | 19 | 18 | 9 | 3 | 91,4 | 0,980 | 13,60 | 6,87 | 17,70 | 9,72 | 9,30 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 18 | 68,1 | 250 | 18 | 18 | 9 | 3 | 86,7 | 0,980 | 14,33 | 6,83 | 17,70 | 9,66 | 9,29 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 250 x 17 | 64,4 | 250 | 17 | 18 | 9 | 3 | 82,1 | 0,980 | 15,14 | 6,79 | 17,70 | 9,60 | 9,28 | ✓ | ✓ | - | ✓ | - | ✓ | - |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | Classification EN 1993-1-1:2005 | | |
|---|---|---------------------|-------------|-------------------------------|-------|-------------------------------|-------|-----------------|------------------------------------|------|------|
| | axis y-y / axis z-z eje y-y / eje z-z oś y-y / oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | I_{yz} | Pure compression | | |
| | $I_y = I_z$ | $W_{ely} = W_{elz}$ | $i_y = i_z$ | I_u | i_u | I_v | i_v | | S355 | S420 | S460 |
| kg/m | cm ⁴ | cm ³ | cm | cm ⁴ | cm | cm ⁴ | cm | cm ⁴ | | | |

| | | | | | | | | | | | | |
|------------------|-----|-------|-------|------|-------|-------|------|------|-------|---|---|---|
| L 300 x 300 x 35 | 154 | 16320 | 767,4 | 9,11 | 25950 | 11,49 | 6696 | 5,83 | -9624 | 1 | 2 | 4 |
| L 300 x 300 x 34 | 150 | 15930 | 747,7 | 9,12 | 25320 | 11,50 | 6532 | 5,84 | -9398 | 1 | 4 | 4 |
| L 300 x 300 x 33 | 146 | 15520 | 727,2 | 9,13 | 24690 | 11,52 | 6351 | 5,84 | -9169 | 2 | 4 | 4 |
| L 300 x 300 x 32 | 142 | 15120 | 707,2 | 9,15 | 24050 | 11,54 | 6184 | 5,85 | -8936 | 2 | 4 | 4 |
| L 300 x 300 x 31 | 138 | 14700 | 686,3 | 9,16 | 23400 | 11,55 | 5999 | 5,85 | -8701 | 4 | 4 | 4 |
| L 300 x 300 x 30 | 133 | 14290 | 666,0 | 9,17 | 22750 | 11,57 | 5828 | 5,86 | -8462 | 4 | 4 | 4 |
| L 300 x 300 x 29 | 129 | 13870 | 645,2 | 9,18 | 22090 | 11,59 | 5650 | 5,86 | -8220 | 4 | 4 | 4 |
| L 300 x 300 x 28 | 125 | 13450 | 624,6 | 9,19 | 21420 | 11,60 | 5475 | 5,87 | -7975 | 4 | 4 | 4 |
| L 300 x 300 x 27 | 121 | 13020 | 603,5 | 9,20 | 20750 | 11,62 | 5294 | 5,87 | -7726 | 4 | 4 | 4 |
| L 300 x 300 x 26 | 116 | 12590 | 582,5 | 9,22 | 20060 | 11,63 | 5115 | 5,87 | -7475 | 4 | 4 | 4 |
| L 300 x 300 x 25 | 112 | 12150 | 561,1 | 9,23 | 19370 | 11,65 | 4930 | 5,88 | -7220 | 4 | 4 | 4 |

| | | | | | | | | | | | | |
|------------------|------|------|-------|------|-------|------|------|------|-------|---|---|---|
| L 250 x 250 x 35 | 128 | 9191 | 524,9 | 7,52 | 14550 | 9,46 | 3832 | 4,85 | -5359 | 1 | 1 | 1 |
| L 250 x 250 x 34 | 124 | 8975 | 511,5 | 7,53 | 14220 | 9,47 | 3734 | 4,86 | -5241 | 1 | 1 | 1 |
| L 250 x 250 x 33 | 121 | 8757 | 498,0 | 7,54 | 13880 | 9,49 | 3636 | 4,86 | -5121 | 1 | 1 | 1 |
| L 250 x 250 x 32 | 118 | 8536 | 484,4 | 7,55 | 13540 | 9,51 | 3538 | 4,86 | -4998 | 1 | 1 | 1 |
| L 250 x 250 x 31 | 114 | 8313 | 470,8 | 7,56 | 13190 | 9,53 | 3439 | 4,86 | -4874 | 1 | 1 | 1 |
| L 250 x 250 x 30 | 111 | 8087 | 457,0 | 7,57 | 12830 | 9,54 | 3340 | 4,87 | -4747 | 1 | 1 | 2 |
| L 250 x 250 x 29 | 107 | 7858 | 443,1 | 7,59 | 12480 | 9,56 | 3241 | 4,87 | -4618 | 1 | 2 | 4 |
| L 250 x 250 x 28 | 104 | 7627 | 429,2 | 7,60 | 12110 | 9,57 | 3141 | 4,88 | -4486 | 1 | 4 | 4 |
| L 250 x 250 x 27 | 101 | 7393 | 415,1 | 7,61 | 11750 | 9,59 | 3040 | 4,88 | -4353 | 2 | 4 | 4 |
| L 250 x 250 x 26 | 96,7 | 7156 | 400,9 | 7,62 | 11370 | 9,61 | 2939 | 4,88 | -4217 | 4 | 4 | 4 |
| L 250 x 250 x 25 | 93,2 | 6917 | 386,7 | 7,63 | 11000 | 9,63 | 2837 | 4,89 | -4079 | 4 | 4 | 4 |
| L 250 x 250 x 24 | 89,7 | 6674 | 372,3 | 7,64 | 10610 | 9,64 | 2735 | 4,89 | -3939 | 4 | 4 | 4 |
| L 250 x 250 x 23 | 86,1 | 6429 | 357,8 | 7,66 | 10230 | 9,66 | 2632 | 4,90 | -3797 | 4 | 4 | 4 |
| L 250 x 250 x 22 | 82,5 | 6180 | 343,3 | 7,67 | 9833 | 9,67 | 2528 | 4,90 | -3652 | 4 | 4 | 4 |
| L 250 x 250 x 21 | 78,9 | 5929 | 328,6 | 7,68 | 9435 | 9,69 | 2423 | 4,91 | -3506 | 4 | 4 | 4 |
| L 250 x 250 x 20 | 75,3 | 5674 | 313,8 | 7,69 | 9031 | 9,70 | 2318 | 4,91 | -3357 | 4 | 4 | 4 |
| L 250 x 250 x 19 | 71,7 | 5417 | 298,9 | 7,70 | 8622 | 9,71 | 2212 | 4,92 | -3205 | 4 | 4 | 4 |
| L 250 x 250 x 18 | 68,1 | 5156 | 283,8 | 7,71 | 8208 | 9,73 | 2104 | 4,93 | -3052 | 4 | 4 | 4 |
| L 250 x 250 x 17 | 64,4 | 4893 | 268,7 | 7,72 | 7789 | 9,74 | 1997 | 4,93 | -2896 | 4 | 4 | 4 |

Equal leg angles ▾ (continued)

Dimensions: EN 10056-1:2017

Tolerances: EN 10056-2:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles con angulares de lados iguales ▾ (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

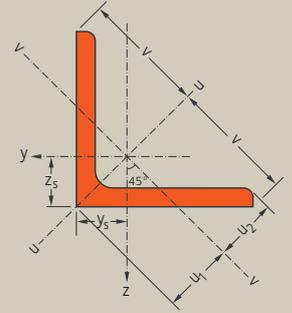
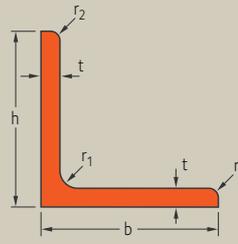
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Kątowniki równoramienne ▾ (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | Surface Superficie Powierzchnia | | | Position of axes Posición de los ejes Położenie osi | | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|-----|----|---------------------------------------|-------------------|-------------------|---|--------------------------------|----|----------------|---|------|----|----------|-----------------|---------|--------|
| | G | h=b | t | r ₁ | A | A _L | A _c | z _s =y _s | v | u ₁ | u ₂ | S355 | | | | | |
| kg/m | mm | mm | mm | cm ² | m ² /m | m ² /t | cm | cm | cm | cm | JR/J0/J2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | S 460 M | 16 Mo3 |

| | | | | | | | | | | | | | | | | | |
|------------------|------|-----|----|----|-------|-------|-------|------|-------|------|------|---|---|---|---|---|---|
| L 200 x 200 x 28 | 82 | 200 | 28 | 18 | 105,0 | 0,785 | 9,56 | 5,99 | 14,10 | 8,47 | 7,28 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 26 | 76,6 | 200 | 26 | 18 | 97,6 | 0,785 | 10,24 | 5,91 | 14,10 | 8,36 | 7,25 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 25 | 73,9 | 200 | 25 | 18 | 94,1 | 0,785 | 10,62 | 5,88 | 14,10 | 8,31 | 7,23 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 24 | 71,1 | 200 | 24 | 18 | 90,6 | 0,785 | 11,03 | 5,84 | 14,10 | 8,26 | 7,21 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 23 | 68,3 | 200 | 23 | 18 | 87,1 | 0,785 | 11,48 | 5,80 | 14,10 | 8,20 | 7,19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 22 | 65,6 | 200 | 22 | 18 | 83,5 | 0,785 | 11,97 | 5,76 | 14,10 | 8,15 | 7,18 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 21 | 62,8 | 200 | 21 | 18 | 79,9 | 0,785 | 12,50 | 5,72 | 14,10 | 8,09 | 7,16 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 20 | 59,9 | 200 | 20 | 18 | 76,3 | 0,785 | 13,09 | 5,68 | 14,10 | 8,04 | 7,15 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 19 | 57,1 | 200 | 19 | 18 | 72,7 | 0,785 | 13,74 | 5,64 | 14,10 | 7,98 | 7,13 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 18 | 54,2 | 200 | 18 | 18 | 69,1 | 0,785 | 14,46 | 5,60 | 14,10 | 7,93 | 7,12 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 17 | 51,4 | 200 | 17 | 18 | 65,5 | 0,785 | 15,27 | 5,56 | 14,10 | 7,87 | 7,10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 16 | 48,5 | 200 | 16 | 18 | 61,8 | 0,785 | 16,18 | 5,52 | 14,10 | 7,81 | 7,09 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 15 | 45,6 | 200 | 15 | 18 | 58,1 | 0,785 | 17,20 | 5,48 | 14,10 | 7,75 | 7,08 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 200 x 13 | 39,8 | 200 | 13 | 18 | 50,7 | 0,785 | 19,73 | 5,40 | 14,10 | 7,63 | 7,06 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

| | | | | | | | | | | | | | | | | | |
|------------------|------|-----|----|----|------|-------|-------|------|-------|------|------|---|---|---|---|---|---|
| L 180 x 180 x 22 | 58,6 | 180 | 22 | 18 | 74,9 | 0,705 | 12,02 | 5,25 | 12,70 | 7,42 | 6,49 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 20 | 53,7 | 180 | 20 | 18 | 68,3 | 0,705 | 13,13 | 5,18 | 12,70 | 7,33 | 6,44 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 19 | 51,1 | 180 | 19 | 18 | 65,1 | 0,705 | 13,78 | 5,14 | 12,70 | 7,27 | 6,42 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 18 | 48,6 | 180 | 18 | 18 | 61,9 | 0,705 | 14,50 | 5,10 | 12,70 | 7,22 | 6,41 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 17 | 46 | 180 | 17 | 18 | 58,7 | 0,705 | 15,30 | 5,06 | 12,70 | 7,16 | 6,40 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 16 | 43,5 | 180 | 16 | 18 | 55,4 | 0,705 | 16,20 | 5,02 | 12,70 | 7,10 | 6,38 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 15 | 40,9 | 180 | 15 | 18 | 52,1 | 0,705 | 17,23 | 4,98 | 12,70 | 7,05 | 6,37 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 14 | 38,3 | 180 | 14 | 18 | 48,8 | 0,705 | 18,40 | 4,94 | 12,70 | 6,99 | 6,36 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 180 x 180 x 13 | 35,7 | 180 | 13 | 18 | 45,5 | 0,705 | 19,74 | 4,90 | 12,70 | 6,93 | 6,35 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

| | | | | | | | | | | | | | | | | | |
|------------------|------|-----|----|----|------|-------|-------|------|-------|------|------|---|---|---|---|---|---|
| L 160 x 160 x 20 | 47,3 | 160 | 20 | 17 | 60,3 | 0,625 | 13,22 | 4,69 | 11,30 | 6,63 | 5,75 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 160 x 160 x 19 | 45,1 | 160 | 19 | 17 | 57,5 | 0,625 | 13,86 | 4,65 | 11,30 | 6,58 | 5,73 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 160 x 160 x 18 | 42,9 | 160 | 18 | 17 | 54,7 | 0,625 | 14,57 | 4,61 | 11,30 | 6,52 | 5,71 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 160 x 160 x 17 | 40,7 | 160 | 17 | 17 | 51,8 | 0,625 | 15,37 | 4,57 | 11,30 | 6,46 | 5,70 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 160 x 160 x 16 | 38,4 | 160 | 16 | 17 | 49,0 | 0,625 | 16,28 | 4,53 | 11,30 | 6,41 | 5,69 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 160 x 160 x 15 | 36,2 | 160 | 15 | 17 | 46,1 | 0,625 | 17,30 | 4,49 | 11,30 | 6,35 | 5,67 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 160 x 160 x 14 | 33,9 | 160 | 14 | 17 | 43,2 | 0,625 | 18,46 | 4,45 | 11,30 | 6,29 | 5,66 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 160 x 160 x 12 | 29,3 | 160 | 12 | 17 | 37,3 | 0,625 | 21,34 | 4,36 | 11,30 | 6,17 | 5,64 | ✓ | - | - | - | - | - |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu* | | | | | | | | | Classification EN 1993-1-1:2005 | | |
|---|--|--|-------------------|-------------------------------|-------------|-------------------------------|-------------|-----------------------------|--------|------------------------------------|------|------|
| | axis y-y / axis z-z eje y-y / eje z-z oś y-y / oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | Pure compression | | S355 | S420 | S460 |
| G kg/m | $I_y = I_z$ cm ⁴ | $W_{ely} = W_{elz}$ cm ³ | $i_y = i_z$ cm | I_u cm ⁴ | i_u cm | I_v cm ⁴ | i_v cm | I_{yz} cm ⁴ | | | | |
| L 200 x 200 x 28 | 82 | 3784 | 270,0 | 6,02 | 5991 | 7,57 | 1576 | 3,88 | -2207 | 1 | - | - |
| L 200 x 200 x 26 | 76,6 | 3560 | 252,7 | 6,04 | 5644 | 7,61 | 1476 | 3,89 | -2084 | 1 | 1 | 1 |
| L 200 x 200 x 25 | 73,9 | 3446 | 244,0 | 6,05 | 5467 | 7,62 | 1426 | 3,89 | -2020 | 1 | 1 | 1 |
| L 200 x 200 x 24 | 71,1 | 3331 | 235,2 | 6,06 | 5286 | 7,64 | 1375 | 3,90 | -1955 | 1 | 1 | 2 |
| L 200 x 200 x 23 | 68,3 | 3213 | 226,3 | 6,08 | 5102 | 7,66 | 1324 | 3,90 | -1889 | 1 | 2 | 4 |
| L 200 x 200 x 22 | 65,6 | 3094 | 217,3 | 6,09 | 4915 | 7,67 | 1273 | 3,90 | -1821 | 1 | 4 | 4 |
| L 200 x 200 x 21 | 62,8 | 2973 | 208,2 | 6,10 | 4725 | 7,69 | 1221 | 3,91 | -1752 | 4 | 4 | 4 |
| L 200 x 200 x 20 | 59,9 | 2851 | 199,1 | 6,11 | 4532 | 7,70 | 1169 | 3,91 | -1681 | 4 | 4 | 4 |
| L 200 x 200 x 19 | 57,1 | 2726 | 189,9 | 6,12 | 4335 | 7,72 | 1117 | 3,92 | -1609 | 4 | 4 | 4 |
| L 200 x 200 x 18 | 54,2 | 2600 | 180,6 | 6,13 | 4135 | 7,74 | 1064 | 3,92 | -1535 | 4 | 4 | 4 |
| L 200 x 200 x 17 | 51,4 | 2472 | 171,2 | 6,14 | 3932 | 7,75 | 1011 | 3,93 | -1461 | 4 | 4 | 4 |
| L 200 x 200 x 16 | 48,5 | 2341 | 161,7 | 6,16 | 3725 | 7,76 | 957,2 | 3,94 | -1384 | 4 | 4 | 4 |
| L 200 x 200 x 15 | 45,6 | 2209 | 152,2 | 6,17 | 3516 | 7,78 | 903,0 | 3,94 | -1306 | 4 | 4 | 4 |
| L 200 x 200 x 13 | 39,8 | 1939 | 132,8 | 6,19 | 3085 | 7,80 | 792,8 | 3,96 | -1146 | 4 | 4 | 4 |
| L 180 x 180 x 22 | 58,6 | 2220 | 174,1 | 5,44 | 3519 | 6,85 | 920,9 | 3,51 | -1299 | 1 | 1 | 1 |
| L 180 x 180 x 20 | 53,7 | 2043 | 159,4 | 5,47 | 3244 | 6,89 | 841,3 | 3,51 | -1202 | 1 | 4 | 4 |
| L 180 x 180 x 19 | 51,1 | 1955 | 152,1 | 5,48 | 3106 | 6,91 | 803,8 | 3,51 | -1151 | 2 | 4 | 4 |
| L 180 x 180 x 18 | 48,6 | 1866 | 144,7 | 5,49 | 2965 | 6,92 | 766,0 | 3,52 | -1100 | 4 | 4 | 4 |
| L 180 x 180 x 17 | 46 | 1775 | 137,2 | 5,50 | 2822 | 6,94 | 727,9 | 3,52 | -1047 | 4 | 4 | 4 |
| L 180 x 180 x 16 | 43,5 | 1682 | 129,7 | 5,51 | 2675 | 6,95 | 689,4 | 3,53 | -993,0 | 4 | 4 | 4 |
| L 180 x 180 x 15 | 40,9 | 1589 | 122,0 | 5,52 | 2527 | 6,96 | 650,6 | 3,53 | -938,0 | 4 | 4 | 4 |
| L 180 x 180 x 14 | 38,3 | 1493 | 114,3 | 5,53 | 2375 | 6,98 | 611,4 | 3,54 | -881,8 | 4 | 4 | 4 |
| L 180 x 180 x 13 | 35,7 | 1396 | 106,5 | 5,54 | 2220 | 6,99 | 571,7 | 3,55 | -824,4 | 4 | 4 | 4 |
| L 160 x 160 x 20 | 47,3 | 1407 | 124,0 | 4,83 | 2231 | 6,08 | 582,0 | 3,11 | -824,4 | 1 | 1 | 1 |
| L 160 x 160 x 19 | 45,1 | 1347 | 118,7 | 4,84 | 2138 | 6,10 | 556,5 | 3,11 | -790,9 | 1 | 1 | 4 |
| L 160 x 160 x 18 | 42,9 | 1287 | 113,0 | 4,85 | 2043 | 6,11 | 530,4 | 3,11 | -756,5 | 1 | 4 | 4 |
| L 160 x 160 x 17 | 40,7 | 1225 | 107,2 | 4,86 | 1947 | 6,13 | 504,2 | 3,12 | -721,2 | 1 | 4 | 4 |
| L 160 x 160 x 16 | 38,4 | 1163 | 101,4 | 4,87 | 1848 | 6,14 | 477,7 | 3,12 | -685,0 | 4 | 4 | 4 |
| L 160 x 160 x 15 | 36,2 | 1099 | 95,47 | 4,88 | 1747 | 6,16 | 450,9 | 3,13 | -647,9 | 4 | 4 | 4 |
| L 160 x 160 x 14 | 33,9 | 1034 | 89,50 | 4,89 | 1644 | 6,17 | 423,9 | 3,13 | -609,9 | 4 | 4 | 4 |
| L 160 x 160 x 12 | 29,3 | 900,0 | 77,30 | 4,91 | 1431 | 6,20 | 369,0 | 3,15 | -531,1 | 4 | - | - |

* Sectional properties have been calculated with $r_2 = 1/2 \cdot r_1$
 * Las propiedades seccionales se han calculado con $r_2 = 1/2 \cdot r_1$
 * Właściwości przekroju zostały obliczone przy $r_2 = 1/2 \cdot r_1$

Equal leg angles ▼ (continued)

Dimensions: EN 10056-1:2017

Tolerances: EN 10056-2:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles con angulares de lados iguales ▼ (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

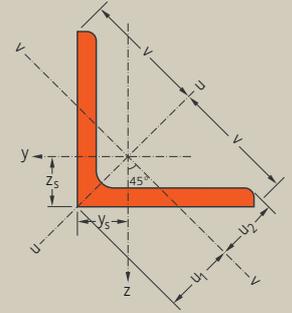
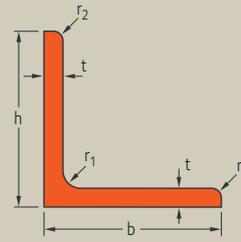
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Kątowniki równoramienne ▼ (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | Surface Superficie Powierzchnia | | | Position of axes Posición de los ejes Położenie osi | | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|-----|----|---------------------------------------|-------------------|-------------------|---|--------------------------------|-------|----------------|---|------|----|----------|-----------------|---------|--------|
| | G | h=b | t | r ₁ | A | A _L | A _G | z _s =y _s | v | u ₁ | u ₂ | S355 | | | | | |
| kg/m | mm | mm | mm | cm ² | m ² /m | m ² /t | cm | cm | cm | cm | JR/J0/J2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | S 460 M | 16.Mo3 |
| L 150 x 150 x 20 | 44,2 | 150 | 20 | 16 | 56,3 | 0,586 | 13,27 | 4,44 | 10,60 | 6,28 | 5,41 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 150 x 150 x 18 | 40,1 | 150 | 18 | 16 | 51,0 | 0,586 | 14,63 | 4,37 | 10,60 | 6,17 | 5,37 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 150 x 150 x 16 | 35,9 | 150 | 16 | 16 | 45,7 | 0,586 | 16,34 | 4,29 | 10,60 | 6,06 | 5,34 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 150 x 150 x 15 | 33,8 | 150 | 15 | 16 | 43,0 | 0,586 | 17,36 | 4,25 | 10,60 | 6,01 | 5,33 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 150 x 150 x 14 | 31,6 | 150 | 14 | 16 | 40,3 | 0,586 | 18,53 | 4,21 | 10,60 | 5,95 | 5,32 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 150 x 150 x 13 | 29,5 | 150 | 13 | 16 | 37,6 | 0,586 | 19,87 | 4,17 | 10,60 | 5,89 | 5,30 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 150 x 150 x 12 | 27,3 | 150 | 12 | 16 | 34,8 | 0,586 | 21,44 | 4,12 | 10,60 | 5,83 | 5,29 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 150 x 150 x 10 | 23,0 | 150 | 10 | 16 | 29,3 | 0,586 | 25,51 | 4,03 | 10,60 | 5,71 | 5,28 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 140 x 140 x 18 | 37,2 | 140 | 18 | 15 | 47,4 | 0,547 | 14,71 | 4,12 | 9,90 | 5,83 | 5,03 | ✓ | - | - | - | - | - |
| L 140 x 140 x 16 | 33,3 | 140 | 16 | 15 | 42,5 | 0,547 | 16,41 | 4,04 | 9,90 | 5,72 | 5,00 | ✓ | - | - | - | - | - |
| L 140 x 140 x 15 | 31,4 | 140 | 15 | 15 | 40,0 | 0,547 | 17,43 | 4,00 | 9,90 | 5,66 | 4,99 | ✓ | - | - | - | - | - |
| L 140 x 140 x 14 | 29,4 | 140 | 14 | 15 | 37,5 | 0,547 | 18,60 | 3,96 | 9,90 | 5,61 | 4,97 | ✓ | - | - | - | - | - |
| L 140 x 140 x 13 | 27,5 | 140 | 13 | 15 | 35,0 | 0,547 | 19,94 | 3,92 | 9,90 | 5,55 | 4,96 | ✓ | - | - | - | - | - |
| L 140 x 140 x 12 | 25,4 | 140 | 12 | 15 | 32,4 | 0,547 | 21,51 | 3,88 | 9,90 | 5,49 | 4,95 | ✓ | - | - | - | - | - |
| L 140 x 140 x 11 | 23,4 | 140 | 11 | 15 | 29,8 | 0,547 | 23,36 | 3,84 | 9,90 | 5,43 | 4,94 | ✓ | - | - | - | - | - |
| L 140 x 140 x 10 | 21,4 | 140 | 10 | 15 | 27,2 | 0,547 | 25,59 | 3,79 | 9,90 | 5,37 | 4,93 | ✓ | - | - | - | - | - |
| L 140 x 140 x 9 | 19,3 | 140 | 9 | 15 | 24,6 | 0,547 | 28,30 | 3,75 | 9,90 | 5,30 | 4,92 | ✓ | - | - | - | - | - |
| L 130 x 130 x 16 | 30,8 | 130 | 16 | 14 | 39,3 | 0,508 | 16,49 | 3,80 | 9,19 | 5,37 | 4,66 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 130 x 130 x 15 | 29,0 | 130 | 15 | 14 | 37,0 | 0,508 | 17,51 | 3,76 | 9,19 | 5,32 | 4,65 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 130 x 130 x 14 | 27,2 | 130 | 14 | 14 | 34,7 | 0,508 | 18,68 | 3,72 | 9,19 | 5,26 | 4,63 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 130 x 130 x 13 | 25,4 | 130 | 13 | 14 | 32,3 | 0,508 | 20,02 | 3,68 | 9,19 | 5,20 | 4,62 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 130 x 130 x 12 | 23,6 | 130 | 12 | 14 | 30,0 | 0,508 | 21,59 | 3,64 | 9,19 | 5,15 | 4,60 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 130 x 130 x 11 | 21,7 | 130 | 11 | 14 | 27,6 | 0,508 | 23,45 | 3,60 | 9,19 | 5,09 | 4,59 | ✓ | ✓ | - | ✓ | - | ✓ |
| L 130 x 130 x 10 | 19,8 | 130 | 10 | 14 | 25,2 | 0,508 | 25,67 | 3,55 | 9,19 | 5,03 | 4,58 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 120 x 15 | 26,6 | 120 | 15 | 13 | 33,9 | 0,469 | 17,60 | 3,51 | 8,49 | 4,97 | 4,31 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 120 x 13 | 23,3 | 120 | 13 | 13 | 29,7 | 0,469 | 20,12 | 3,44 | 8,49 | 4,86 | 4,28 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 120 x 12 | 21,6 | 120 | 12 | 13 | 27,5 | 0,469 | 21,69 | 3,40 | 8,49 | 4,80 | 4,26 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 120 x 11 | 19,9 | 120 | 11 | 13 | 25,4 | 0,469 | 23,54 | 3,36 | 8,49 | 4,75 | 4,25 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 120 x 10 | 18,2 | 120 | 10 | 13 | 23,2 | 0,469 | 25,76 | 3,31 | 8,49 | 4,69 | 4,24 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 120 x 8 | 14,7 | 120 | 8 | 13 | 18,7 | 0,469 | 31,87 | 3,23 | 8,49 | 4,56 | 4,22 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu* | | | | | | | | | Classification EN 1993-1-1:2005 | | |
|---|--|-----------------|---------------------|-------------------------------|-------|-------------------------------|-------|-----------------|------------------|------------------------------------|------|------|
| | axis y-y / axis z-z eje y-y / eje z-z oś y-y / oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | I_{yz} | Pure compression | | | |
| | G | $I_y = I_z$ | $W_{ely} = W_{elz}$ | $i_y = i_z$ | I_u | i_u | I_v | | i_v | I_{yz} | S355 | S420 |
| kg/m | cm ⁴ | cm ³ | cm | cm ⁴ | cm | cm ⁴ | cm | cm ⁴ | | | | |
| L 150 x 150 x 20 | 44,2 | 1146 | 108,6 | 4,51 | 1817 | 5,68 | 476,2 | 2,91 | -670,2 | 1 | 1 | 1 |
| L 150 x 150 x 18 | 40,1 | 1050 | 98,74 | 4,54 | 1666 | 5,71 | 433,8 | 2,92 | -616,1 | 1 | 1 | 1 |
| L 150 x 150 x 16 | 35,9 | 949,7 | 88,65 | 4,56 | 1509 | 5,74 | 390,8 | 2,92 | -558,9 | 4 | 4 | 4 |
| L 150 x 150 x 15 | 33,8 | 898,1 | 83,52 | 4,57 | 1427 | 5,76 | 369,0 | 2,93 | -529,1 | 4 | 4 | 4 |
| L 150 x 150 x 14 | 31,6 | 845,4 | 78,33 | 4,58 | 1344 | 5,77 | 346,9 | 2,93 | -498,5 | 4 | 4 | 4 |
| L 150 x 150 x 13 | 29,5 | 791,7 | 73,07 | 4,59 | 1259 | 5,79 | 324,6 | 2,94 | -467,1 | 4 | 4 | 4 |
| L 150 x 150 x 12 | 27,3 | 736,9 | 67,75 | 4,60 | 1172 | 5,80 | 302,1 | 2,94 | -434,9 | 4 | 4 | 4 |
| L 150 x 150 x 10 | 23,0 | 624,0 | 56,91 | 4,62 | 992 | 5,82 | 256,1 | 2,96 | -368,0 | 4 | 4 | 4 |
| L 140 x 140 x 18 | 37,2 | 844,0 | 85,40 | 4,22 | 1338 | 5,31 | 350,0 | 2,72 | -494,1 | 1 | - | - |
| L 140 x 140 x 16 | 33,3 | 764,4 | 76,77 | 4,24 | 1214 | 5,34 | 315,2 | 2,72 | -449,2 | 1 | - | - |
| L 140 x 140 x 15 | 31,4 | 723,3 | 72,36 | 4,25 | 1149 | 5,36 | 297,7 | 2,73 | -425,6 | 2 | - | - |
| L 140 x 140 x 14 | 29,4 | 681,4 | 67,89 | 4,26 | 1083 | 5,37 | 280,0 | 2,73 | -401,4 | 4 | - | - |
| L 140 x 140 x 13 | 27,5 | 638,5 | 63,37 | 4,27 | 1015 | 5,39 | 262,0 | 2,74 | -376,5 | 4 | - | - |
| L 140 x 140 x 12 | 25,4 | 594,8 | 58,78 | 4,28 | 945,7 | 5,40 | 243,9 | 2,74 | -350,9 | 4 | - | - |
| L 140 x 140 x 11 | 23,4 | 550,1 | 54,14 | 4,29 | 874,7 | 5,41 | 225,5 | 2,75 | -324,6 | 4 | - | - |
| L 140 x 140 x 10 | 21,4 | 504,4 | 49,43 | 4,30 | 802,0 | 5,43 | 206,9 | 2,76 | -297,6 | 4 | - | - |
| L 140 x 140 x 9 | 19,3 | 457,8 | 44,66 | 4,31 | 727,6 | 5,44 | 188,0 | 2,76 | -269,8 | 4 | - | - |
| L 130 x 130 x 16 | 30,8 | 605,0 | 65,75 | 3,93 | 959,7 | 4,94 | 250,3 | 2,53 | -354,7 | 1 | 1 | 1 |
| L 130 x 130 x 15 | 29,0 | 572,9 | 62,00 | 3,94 | 909,4 | 4,96 | 236,3 | 2,53 | -336,5 | 1 | 4 | 4 |
| L 130 x 130 x 14 | 27,2 | 540,1 | 58,20 | 3,95 | 857,8 | 4,98 | 222,3 | 2,53 | -317,8 | 1 | 4 | 4 |
| L 130 x 130 x 13 | 25,4 | 506,5 | 54,35 | 3,96 | 804,9 | 4,99 | 208,1 | 2,54 | -298,4 | 4 | 4 | 4 |
| L 130 x 130 x 12 | 23,6 | 472,2 | 50,44 | 3,97 | 750,6 | 5,00 | 193,7 | 2,54 | -278,4 | 4 | 4 | 4 |
| L 130 x 130 x 11 | 21,7 | 437,1 | 46,48 | 3,98 | 694,9 | 5,02 | 179,2 | 2,55 | -257,9 | 4 | 4 | 4 |
| L 130 x 130 x 10 | 19,8 | 401,1 | 42,47 | 3,99 | 637,8 | 5,03 | 164,5 | 2,55 | -236,7 | 4 | 4 | 4 |
| L 120 x 120 x 15 | 26,6 | 444,9 | 52,43 | 3,62 | 705,6 | 4,56 | 184,2 | 2,33 | -260,7 | 1 | 1 | 1 |
| L 120 x 120 x 13 | 23,3 | 394,0 | 46,01 | 3,64 | 625,8 | 4,59 | 162,2 | 2,34 | -231,8 | 1 | 4 | 4 |
| L 120 x 120 x 12 | 21,6 | 367,7 | 42,73 | 3,65 | 584,3 | 4,61 | 151,1 | 2,34 | -216,6 | 4 | 4 | 4 |
| L 120 x 120 x 11 | 19,9 | 340,6 | 39,41 | 3,66 | 541,5 | 4,62 | 139,8 | 2,35 | -200,9 | 4 | 4 | 4 |
| L 120 x 120 x 10 | 18,2 | 312,9 | 36,03 | 3,67 | 497,6 | 4,63 | 128,3 | 2,35 | -184,6 | 4 | 4 | 4 |
| L 120 x 120 x 8 | 14,7 | 255,4 | 29,11 | 3,69 | 406,0 | 4,65 | 104,8 | 2,37 | -150,6 | 4 | 4 | 4 |

* Sectional properties have been calculated with $r_2 = 1/2 \cdot r_1$

* Las propiedades seccionales se han calculado con $r_2 = 1/2 \cdot r_1$

* Właściwości przekroju zostały obliczone przy $r_2 = 1/2 \cdot r_1$

Equal leg angles ▾ (continued)

Dimensions: EN 10056-1:2017

Tolerances: EN 10056-2:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles con angulares de lados iguales ▾ (continúa)

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

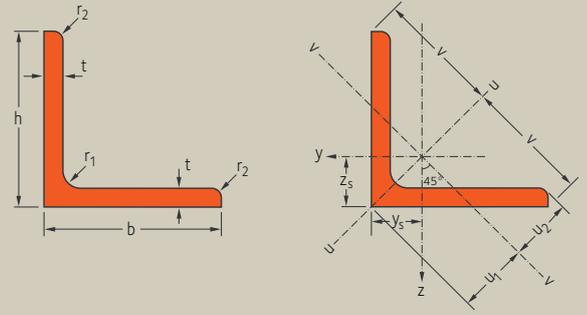
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Kątownicy równoramienne ▾ (ciąg dalszy)

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | Surface Superficie Powierzchnia | | | Position of axes Posición de los ejes Polożenie osi | | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|-----|----|---------------------------------------|-------------------|-------------------|---|--------------------------------|------|----------------|---|------|----|----------|-----------------|---------|--------|
| | G | h=b | t | r ₁ | A | A _L | A _C | z _s =y _s | v | u ₁ | u ₂ | S355 | | | | | |
| kg/m | mm | mm | mm | cm ² | m ² /m | m ² /t | cm | cm | cm | cm | JR/J0/J2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | S 460 M | 16 Mo3 |
| L 100 x 100 x 12 | 17,8 | 100 | 12 | 12 | 22,7 | 0,390 | 21,86 | 2,90 | 7,07 | 4,11 | 3,57 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 100 x 100 x 10 | 15,0 | 100 | 10 | 12 | 19,2 | 0,390 | 25,92 | 2,82 | 7,07 | 3,99 | 3,54 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 100 x 100 x 8 | 12,2 | 100 | 8 | 12 | 15,5 | 0,390 | 32,00 | 2,74 | 7,07 | 3,87 | 3,52 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 100 x 100 x 7 | 10,7 | 100 | 7 | 12 | 13,7 | 0,390 | 36,33 | 2,69 | 7,07 | 3,81 | 3,51 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 90 x 90 x 11 | 14,7 | 90 | 11 | 11 | 18,7 | 0,351 | 23,86 | 2,62 | 6,36 | 3,70 | 3,21 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 90 x 90 x 10 | 13,4 | 90 | 10 | 11 | 17,1 | 0,351 | 26,07 | 2,58 | 6,36 | 3,65 | 3,19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 90 x 90 x 9 | 12,2 | 90 | 9 | 11 | 15,5 | 0,351 | 28,77 | 2,54 | 6,36 | 3,59 | 3,18 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 90 x 90 x 8 | 10,9 | 90 | 8 | 11 | 13,9 | 0,351 | 32,15 | 2,50 | 6,36 | 3,53 | 3,17 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 90 x 90 x 7 | 9,61 | 90 | 7 | 11 | 12,2 | 0,351 | 36,48 | 2,45 | 6,36 | 3,47 | 3,16 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 90 x 90 x 6 | 8,3 | 90 | 6 | 11 | 10,6 | 0,351 | 42,44 | 2,42 | 6,36 | 3,42 | 3,16 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 80 x 80 x 10 | 11,9 | 80 | 10 | 10 | 15,1 | 0,311 | 26,26 | 2,34 | 5,66 | 3,30 | 2,85 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 80 x 80 x 8 | 9,63 | 80 | 8 | 10 | 12,3 | 0,311 | 32,34 | 2,26 | 5,66 | 3,19 | 2,83 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 80 x 80 x 7 | 8,49 | 80 | 7 | 10 | 10,8 | 0,311 | 36,67 | 2,21 | 5,66 | 3,13 | 2,82 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 80 x 80 x 6 | 7,34 | 80 | 6 | 10 | 9,35 | 0,311 | 42,44 | 2,17 | 5,66 | 3,07 | 2,81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 80 x 80 x 5 | 6,17 | 80 | 5 | 10 | 7,86 | 0,311 | 50,49 | 2,12 | 5,66 | 3,00 | 2,81 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 75 x 75 x 10 | 11,1 | 75 | 10 | 9 | 14,1 | 0,292 | 26,43 | 2,22 | 5,30 | 3,13 | 2,69 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 75 x 75 x 8 | 8,99 | 75 | 8 | 9 | 11,4 | 0,292 | 32,53 | 2,14 | 5,30 | 3,02 | 2,66 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 75 x 75 x 7 | 7,93 | 75 | 7 | 9 | 10,1 | 0,292 | 36,88 | 2,10 | 5,30 | 2,96 | 2,65 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 75 x 75 x 6 | 6,85 | 75 | 6 | 9 | 8,73 | 0,292 | 42,66 | 2,05 | 5,30 | 2,90 | 2,64 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 75 x 75 x 5 | 5,76 | 75 | 5 | 9 | 7,34 | 0,292 | 50,75 | 2,01 | 5,30 | 2,84 | 2,63 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 75 x 75 x 4 | 4,65 | 75 | 4 | 9 | 5,93 | 0,292 | 62,82 | 1,96 | 5,30 | 2,76 | 2,63 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 60 x 60 x 8 | 7,09 | 60 | 8 | 8 | 9,03 | 0,233 | 32,89 | 1,77 | 4,24 | 2,50 | 2,14 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 60 x 60 x 6 | 5,42 | 60 | 6 | 8 | 6,91 | 0,233 | 42,99 | 1,69 | 4,24 | 2,39 | 2,11 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 60 x 60 x 5 | 4,57 | 60 | 5 | 8 | 5,82 | 0,233 | 51,04 | 1,64 | 4,24 | 2,32 | 2,11 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 60 x 60 x 4 | 3,7 | 60 | 4 | 8 | 4,71 | 0,233 | 63,07 | 1,60 | 4,24 | 2,26 | 2,10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 50 x 50 x 6 | 4,47 | 50 | 6 | 7 | 5,69 | 0,194 | 43,41 | 1,45 | 3,54 | 2,04 | 1,77 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 50 x 50 x 5 | 3,77 | 50 | 5 | 7 | 4,80 | 0,194 | 51,46 | 1,40 | 3,54 | 1,99 | 1,76 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 50 x 50 x 4 | 3,06 | 50 | 4 | 7 | 3,89 | 0,194 | 63,49 | 1,36 | 3,54 | 1,92 | 1,75 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 45 x 45 x 4 | 2,74 | 45 | 4 | 7 | 3,49 | 0,174 | 63,46 | 1,23 | 3,18 | 1,75 | 1,57 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu* | | | | | | | | | Classification EN 1993-1-1:2005 | | |
|---|--|---------------------|-------------|-------------------------------|-------|-------------------------------|-------|------------------|--------|------------------------------------|------|---|
| | axis y-y / axis z-z eje y-y / eje z-z oś y-y / oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | Pure compression | | | | |
| G | $I_y = I_z$ | $W_{ely} = W_{elz}$ | $i_y = i_z$ | I_u | i_u | I_v | i_v | I_{yz} | S355 | S420 | S460 | |
| kg/m | cm ⁴ | cm ³ | cm | cm ⁴ | cm | cm ⁴ | cm | cm ⁴ | | | | |
| L 100 x 100 x 12 | 17,8 | 206,7 | 29,12 | 3,02 | 327,9 | 3,80 | 85,44 | 1,94 | -121,3 | 1 | 1 | 4 |
| L 100 x 100 x 10 | 15,0 | 176,7 | 24,62 | 3,04 | 280,7 | 3,83 | 72,66 | 1,95 | -104,0 | 4 | 4 | 4 |
| L 100 x 100 x 8 | 12,2 | 144,8 | 19,94 | 3,06 | 230,2 | 3,85 | 59,49 | 1,96 | -85,35 | 4 | 4 | 4 |
| L 100 x 100 x 7 | 10,7 | 128,2 | 17,54 | 3,06 | 203,7 | 3,86 | 52,72 | 1,96 | -75,48 | 4 | 4 | 4 |
| L 90 x 90 x 11 | 14,7 | 137,6 | 21,57 | 2,71 | 218,3 | 3,42 | 56,94 | 1,74 | -80,70 | 1 | 1 | 1 |
| L 90 x 90 x 10 | 13,4 | 126,9 | 19,77 | 2,72 | 201,5 | 3,43 | 52,33 | 1,75 | -74,59 | 1 | 4 | 4 |
| L 90 x 90 x 9 | 12,2 | 115,8 | 17,93 | 2,73 | 184,0 | 3,44 | 47,65 | 1,75 | -68,19 | 4 | 4 | 4 |
| L 90 x 90 x 8 | 10,9 | 104,4 | 16,05 | 2,74 | 165,9 | 3,46 | 42,89 | 1,76 | -61,50 | 4 | 4 | 4 |
| L 90 x 90 x 7 | 9,61 | 92,55 | 14,13 | 2,75 | 147,1 | 3,47 | 38,03 | 1,76 | -54,52 | 4 | 4 | 4 |
| L 90 x 90 x 6 | 8,3 | 80,72 | 12,26 | 2,77 | 128,3 | 3,49 | 33,16 | 1,77 | -47,57 | 4 | 4 | 4 |
| L 80 x 80 x 10 | 11,9 | 87,50 | 15,45 | 2,41 | 138,8 | 3,03 | 36,24 | 1,55 | -51,27 | 1 | 1 | 1 |
| L 80 x 80 x 8 | 9,63 | 72,25 | 12,58 | 2,43 | 114,8 | 3,06 | 29,72 | 1,56 | -42,52 | 4 | 4 | 4 |
| L 80 x 80 x 7 | 8,49 | 64,19 | 11,09 | 2,44 | 102,0 | 3,07 | 26,38 | 1,56 | -37,81 | 4 | 4 | 4 |
| L 80 x 80 x 6 | 7,34 | 55,82 | 9,57 | 2,44 | 88,69 | 3,08 | 22,96 | 1,57 | -32,87 | 4 | 4 | 4 |
| L 80 x 80 x 5 | 6,17 | 47,14 | 8,02 | 2,45 | 74,83 | 3,09 | 19,45 | 1,57 | -27,69 | 4 | 4 | 4 |
| L 75 x 75 x 10 | 11,1 | 71,43 | 13,52 | 2,25 | 113,2 | 2,83 | 29,68 | 1,45 | -41,75 | 1 | 1 | 1 |
| L 75 x 75 x 8 | 8,99 | 59,13 | 11,03 | 2,27 | 93,91 | 2,86 | 24,35 | 1,46 | -34,78 | 4 | 4 | 4 |
| L 75 x 75 x 7 | 7,93 | 52,61 | 9,74 | 2,28 | 83,6 | 2,88 | 21,62 | 1,46 | -30,99 | 4 | 4 | 4 |
| L 75 x 75 x 6 | 6,85 | 45,83 | 8,41 | 2,29 | 72,84 | 2,89 | 18,82 | 1,47 | -27,01 | 4 | 4 | 4 |
| L 75 x 75 x 5 | 5,76 | 38,77 | 7,06 | 2,30 | 61,59 | 2,90 | 15,96 | 1,47 | -22,82 | 4 | 4 | 4 |
| L 75 x 75 x 4 | 4,65 | 31,43 | 5,67 | 2,30 | 49,85 | 2,90 | 13,01 | 1,48 | -18,42 | 4 | 4 | 4 |
| L 60 x 60 x 8 | 7,09 | 29,15 | 6,89 | 1,80 | 46,19 | 2,26 | 12,11 | 1,16 | -17,04 | 1 | 1 | 1 |
| L 60 x 60 x 6 | 5,42 | 22,79 | 5,29 | 1,82 | 36,2 | 2,29 | 9,38 | 1,17 | -13,41 | 4 | 4 | 4 |
| L 60 x 60 x 5 | 4,57 | 19,37 | 4,45 | 1,82 | 30,77 | 2,30 | 7,97 | 1,17 | -11,40 | 4 | 4 | 4 |
| L 60 x 60 x 4 | 3,7 | 15,78 | 3,58 | 1,83 | 25,04 | 2,31 | 6,51 | 1,18 | -9,26 | 4 | 4 | 4 |
| L 50 x 50 x 6 | 4,47 | 12,84 | 3,61 | 1,50 | 20,37 | 1,89 | 5,31 | 0,97 | -7,53 | 1 | 1 | 4 |
| L 50 x 50 x 5 | 3,77 | 10,96 | 3,05 | 1,51 | 17,41 | 1,90 | 4,52 | 0,97 | -6,45 | 4 | 4 | 4 |
| L 50 x 50 x 4 | 3,06 | 8,97 | 2,46 | 1,52 | 14,25 | 1,91 | 3,70 | 0,97 | -5,28 | 4 | 4 | 4 |
| L 45 x 45 x 4 | 2,74 | 6,43 | 1,97 | 1,36 | 10,21 | 1,71 | 2,65 | 0,87 | -3,78 | 4 | 4 | 4 |

* Sectional properties have been calculated with $r_2 = 1/2 \cdot r_1$

* Las propiedades seccionales se han calculado con $r_2 = 1/2 \cdot r_1$

* Właściwości przekroju zostały obliczone przy $r_2 = 1/2 \cdot r_1$

Unequal leg angles ▼

Dimensions: EN 10056-1:2017

Tolerances: EN 10056-2:1993

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles angulares de lados desiguales ▼

Dimensiones: EN 10365:2017

Tolerancias: EN 10034:1993

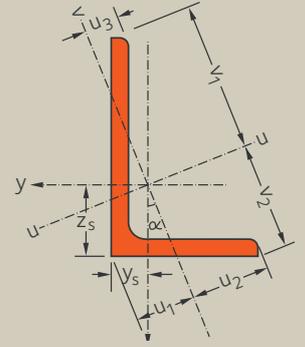
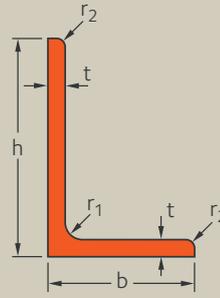
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Kątowniki nierównoramienne ▼

Wymiary: EN 10365:2017

Tolerancje: EN 10034:1993

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | Surface Superficie Powierzchnia | | | Position of axes Posición de los ejes Polożenie osi | | | | | | | Steel grades Calidades de acero Gatunki stali | | | | | | | |
|---|--------------------------------------|-----|-----|----------------|----------------|---------------------------------------|-------------------|-------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|---|---|----|----------|-----------------|---------|--------|---|
| | h | b | t | r ₁ | r ₂ | A | A _L | A _G | z _s | y _s | v ₁ | v ₂ | u ₁ | u ₂ | u ₃ | S355 | | | | | | | |
| G kg/m | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | cm | cm | cm | cm | cm | cm | cm | JR/J0/J2/K2 | M | ML | Arcorox® | MO / MLO / ML10 | S 460 M | 16 Mo3 | |
| L 250 x 90 x 16 ♦ | 40,9 | 250 | 90 | 16 | 18 | 9 | 52,1 | 0,665 | 16,22 | 9.70 | 1,81 | 15,4 | 10,66 | 3,22 | 5,61 | 1,76 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 90 x 14 ♦ | 36,1 | 250 | 90 | 14 | 18 | 9 | 46 | 0,665 | 18,41 | 9.60 | 1,72 | 15,48 | 10,58 | 3,14 | 5,66 | 1,68 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 250 x 90 x 12 ♦ | 31,2 | 250 | 90 | 12 | 18 | 9 | 39,7 | 0,665 | 21,32 | 9.50 | 1,64 | 15,57 | 10,5 | 3,06 | 5,71 | 1,6 | ✓ | ✓ | - | ✓ | - | ✓ | - |
| L 200 x 100 x 16 ♦ | 35,9 | 200 | 100 | 16 | 15 | 7,5 | 45,7 | 0,587 | 16,37 | 7.20 | 2,26 | 12,95 | 8,92 | 3,99 | 5,82 | 2,31 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 100 x 15 | 33,7 | 200 | 100 | 15 | 15 | 7,5 | 43 | 0,587 | 17,4 | 7.16 | 2,22 | 12,98 | 8,89 | 3,95 | 5,84 | 2,27 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 100 x 14 | 31,6 | 200 | 100 | 14 | 15 | 7,5 | 40,3 | 0,587 | 18,57 | 7.12 | 2,18 | 13,01 | 8,86 | 3,91 | 5,85 | 2,24 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 100 x 12 | 27,3 | 200 | 100 | 12 | 15 | 7,5 | 34,8 | 0,587 | 21,49 | 7.03 | 2,1 | 13,08 | 8,81 | 3,82 | 5,89 | 2,17 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 200 x 100 x 10 40 | 23,0 | 200 | 100 | 10 | 15 | 7,5 | 29,2 | 0,587 | 25,58 | 6.93 | 2,01 | 13,15 | 8,74 | 3,72 | 5,94 | 2,09 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 80 x 12 | 17,8 | 120 | 80 | 12 | 11 | 5,5 | 22,7 | 0,391 | 21,93 | 4.00 | 2,03 | 8,14 | 6,04 | 3,45 | 4,16 | 2,2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 80 x 10 | 15,0 | 120 | 80 | 10 | 11 | 5,5 | 19,1 | 0,391 | 26,01 | 3.92 | 1,95 | 8,19 | 6,01 | 3,35 | 4,17 | 2,15 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 120 x 80 x 8 | 12,2 | 120 | 80 | 8 | 11 | 5,5 | 15,5 | 0,391 | 32,12 | 3.83 | 1,87 | 8,23 | 5,97 | 3,25 | 4,19 | 2,09 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

40 Minimum order: 40t per section and grade or upon agreement.

♦ Dimensions ArcelorMittal standard
▼ Other dimensions on request

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.

♦ Dimensiones estándar de ArcelorMittal
▼ Otras dimensiones bajo pedido

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.

♦ Standardowe wymiary ArcelorMittal
▼ Inne wymiary na zapytanie



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | Classification EN 1993-1-1:2005 | | | | |
|---|---|---------------------|-------------|-------------------------------|-------|-------------------------------|-------|-----------------|------------------|-------|------|------------------------------------|------|---|---|---|
| | axis y-y / axis z-z eje y-y / eje z-z oś y-y / oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | I_{yz} | Pure compression | | | | | | | |
| | $I_y = I_z$ | $W_{ely} = W_{elz}$ | $i_y = i_z$ | I_u | i_u | I_v | i_v | | S355 | S420 | S460 | | | | | |
| kg/m | cm ⁴ | cm ³ | cm | cm ⁴ | cm | cm ⁴ | cm | cm ⁴ | | | | | | | | |
| L 250 x 90 x 16 | 40,9 | 3327 | 217,5 | 7,98 | 239,2 | 33,25 | 2,14 | 3398 | 8,07 | 168,1 | 1,79 | -473,9 | 8,53 | 4 | 4 | 4 |
| L 250 x 90 x 14 | 36,1 | 2952 | 191,7 | 8,01 | 213,5 | 29,35 | 2,15 | 3016 | 8,10 | 149,1 | 1,80 | -425,0 | 8,62 | 4 | 4 | 4 |
| L 250 x 90 x 12 | 31,2 | 2565 | 165,5 | 8,04 | 186,6 | 25,36 | 2,17 | 2622 | 8,13 | 129,6 | 1,81 | -372,7 | 8,70 | 4 | 4 | 4 |
| L 200 x 100 x 16 | 35,9 | 1861 | 145,4 | 6,38 | 315,6 | 40,76 | 2,63 | 1972 | 6,57 | 204,3 | 2,11 | -429,3 | 14,5 | 4 | 4 | 4 |
| L 200 x 100 x 15 | 33,7 | 1758 | 137,0 | 6,40 | 299,1 | 38,44 | 2,64 | 1865 | 6,59 | 193,1 | 2,12 | -407,4 | 14,6 | 4 | 4 | 4 |
| L 200 x 100 x 14 | 31,6 | 1654 | 128,4 | 6,41 | 282,2 | 36,08 | 2,65 | 1755 | 6,60 | 181,7 | 2,12 | -384,8 | 14,7 | 4 | 4 | 4 |
| L 200 x 100 x 12 | 27,3 | 1440 | 111,0 | 6,43 | 247,2 | 31,28 | 2,67 | 1529 | 6,63 | 158,5 | 2,13 | -337,3 | 14,7 | 4 | 4 | 4 |
| L 200 x 100 x 10 | 23,0 | 1219 | 93,24 | 6,46 | 210,3 | 26,33 | 2,68 | 1294 | 6,65 | 134,5 | 2,14 | -286,8 | 14,8 | 4 | 4 | 4 |
| L 120 x 80 x 12 | 17,8 | 322,8 | 40,37 | 3,77 | 114,3 | 19,14 | 2,24 | 370,7 | 4,04 | 66,45 | 1,71 | -110,8 | 23,4 | 4 | 4 | 4 |
| L 120 x 80 x 10 | 15,0 | 275,5 | 34,10 | 3,80 | 98,11 | 16,21 | 2,26 | 317,0 | 4,07 | 56,60 | 1,72 | -95,30 | 23,5 | 4 | 4 | 4 |
| L 120 x 80 x 8 | 12,2 | 225,7 | 27,63 | 3,82 | 80,76 | 13,17 | 2,28 | 260,0 | 4,10 | 46,39 | 1,73 | -78,50 | 23,7 | 4 | 4 | 4 |

Square bars

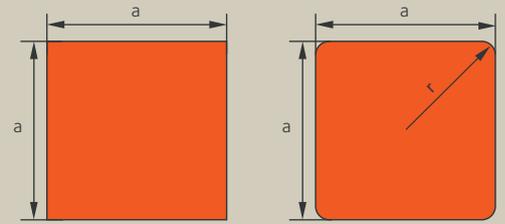
Dimensions: EN 10059:2003
Tolerances: EN 10059:2003
Surface condition: EN 10059:2003

Barras cuadradas

Dimensiones: EN 10059:2003
Tolerancias: EN 10059:2003
Condición de superficie: EN 10059:2003

Pręty kwadratowe

Wymiary: EN 10059:2003
Tolerancje: EN 10059:2003
Jakość powierzchni: EN 10059:2003



| a x a | Square bars Barras cuadradas Pręty kwadratowe | Rounded edges ♦ Aristas redondeadas ♦ Z zaokrąglonymi krawędziami ♦ | | EN 10025-2:2019 | EN ISO 683-1:2018 |
|-----------|---|---|----------------------------|-----------------|-------------------|
| | Mass / Masa / Masa kg/m | r ¹⁾ mm | Mass / Masa / Masa kg/m | | |
| 90 x 90 | 63,6 | - | - | ✓ | ✓ |
| 100 x 100 | 78,5 | - | - | ✓ | ✓ |
| 110 x 110 | 95,0 | - | - | ✓ | ✓ |
| 120 x 120 | 113,0 | - | - | ✓ | ✓ |
| 130 x 130 | 132,6 | - | - | ✓ | ✓ |
| 140 x 140 | - | 153,2 | 10 | ✓ | ✓ |
| 150 x 150 | - | 176,0 | 10 | ✓ | ✓ |
| 160 x 160 | - | 200,3 | 10 | ✓ | ✓ |

♦ Dimensions and tolerances: ArcelorMittal Standard

♦ Dimensiones y tolerancias: ArcelorMittal Standard

♦ Wymiary i tolerancje: Standard ArcelorMittal

¹⁾ Tolerances on r +3/-5mm

¹⁾ Tolerancias sobre r +3/-5mm

¹⁾ Tolerancja promienia zaokrąglenia r +3/-5mm

Hot rolled round steel bars

Dimensions: EN 10060:2003

Tolerances: EN 10060:2003

Surface condition: according to ISO 9443:2018, class B

Barras redondas de acero laminadas en caliente

Dimensiones: EN 10060:2003

Tolerancias: EN 10060:2003

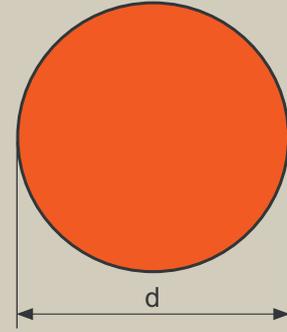
Condición de superficie: según EN 10221:1995, clase B

Pręty gładkie okrągłe

Wymiary: EN 10060:2003

Tolerancje: EN 10060:2003

Jakość powierzchni: wg. EN 10221:1995, klasa B



| Designation Denominación Oznaczenie | Diameter Diámetro Średnica | Surface Superficie Powierzchnia | EN 10025-2:2019 |
|---|----------------------------------|---------------------------------------|-----------------|
| G | d | A | |
| kg/m | mm | cm ² | |

| | | | | |
|-------|-------|-----|-------|---|
| R 90 | 49,9 | 90 | 63,6 | ✓ |
| R 100 | 61,7 | 100 | 78,5 | ✓ |
| R 110 | 74,6 | 110 | 95,0 | ✓ |
| R 120 | 88,8 | 120 | 113,1 | ✓ |
| R 130 | 104,2 | 130 | 132,7 | ✓ |
| R 140 | 120,8 | 140 | 153,9 | ✓ |
| R 150 | 138,7 | 150 | 176,7 | ✓ |

Hearst Tower, New York
United States



American Sections

Perfiles americanos

Kształtowniki amerykańskie

| | | |
|---|---|---|
| 112 American wide flange sections W | 112 W Perfiles americanos de alas paralelas | 112 Amerykańskie dwuteowniki szerokostopowe W |
| 130 American standard sections S | 130 S Perfiles americanos de alas inclinadas | 130 Amerykańskie dwuteowniki standardowe S |
| 132 American wide flange bearing piles HP | 132 HP Perfiles americanos de alas anchas para pilotes | 132 Amerykańskie pale szerokostopowe HP |
| 134 American standard channels C | 134 C Perfiles americanos estándar de alas inclinadas | 134 Amerykańskie ceowniki standardowe C |
| 136 American channels MC | 136 MC Perfiles americanos de alas inclinadas | 136 Amerykańskie ceowniki MC |
| 138 American equal leg angles L | 138 L Perfiles americanos angulares de lados iguales | 138 Amerykańskie kątowniki równoramienne L |
| 142 American unequal leg angles L | 142 L Perfiles americanos angulares de lados desiguales | 142 Amerykańskie kątowniki nierównoramienne L |
| 144 WTM (Web Tailor-Made) plates | 144 Chapas WTM (con ancho a medida) | 144 Dostosowane płaskowniki WTM |

American wide flange sections

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

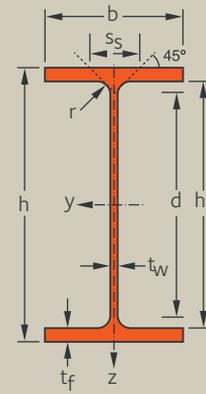
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie dwuteowniki szerokostopowe

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|----|----------------|----------------|----|----------------|----|-----------------|---------------------------------------|-------------------|---------------------|---|-------------------|----------|-----------------|--|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50, 65 & 70 | Grade 80 | | |

| | | | | | | | | | | | | | | | | | |
|--------------------|----|-----|------|-----|------|------|----|--------|-------|-------|-------|-------|---|---|---|---|---|
| W 1100 x 400 x 607 | 40 | 607 | 1138 | 410 | 31,0 | 55,0 | 30 | 1028,0 | 968,0 | 777,4 | 3,802 | 6,230 | ✓ | ✓ | ✓ | ✓ | - |
| W 1100 x 400 x 548 | 40 | 548 | 1128 | 407 | 28,0 | 50,0 | 30 | 1028,0 | 968,0 | 702,5 | 3,776 | 6,847 | ✓ | ✓ | ✓ | - | ✓ |
| W 1100 x 400 x 499 | 40 | 499 | 1118 | 405 | 26,0 | 45,0 | 30 | 1028,0 | 968,0 | 635,0 | 3,752 | 7,474 | ✓ | ✓ | ✓ | - | ✓ |
| W 1100 x 400 x 433 | 40 | 433 | 1108 | 402 | 22,0 | 40,0 | 30 | 1028,0 | 968,0 | 551,0 | 3,728 | 8,549 | ✓ | ✓ | ✓ | - | ✓ |
| W 1100 x 400 x 390 | 40 | 390 | 1100 | 400 | 20,0 | 36,0 | 30 | 1028,0 | 968,0 | 497,0 | 3,708 | 9,422 | ✓ | ✓ | ✓ | - | ✓ |
| W 1100 x 400 x 343 | 40 | 343 | 1090 | 400 | 18,0 | 31,0 | 30 | 1028,0 | 968,0 | 436,0 | 3,692 | 10,67 | ✓ | ✓ | ✓ | - | ✓ |

| | | | | | | | | | | | | | | | | | |
|--------------------|----|-----|------|-----|------|------|----|-------|-------|--------|-------|-------|---|---|---|---|---|
| W 1000 x 400 x 976 | 40 | 976 | 1108 | 428 | 50,0 | 89,9 | 30 | 928,1 | 868,1 | 1243,0 | 3,776 | 3,880 | ✓ | ✓ | ✓ | ✓ | - |
| W 1000 x 400 x 883 | 40 | 883 | 1092 | 424 | 45,5 | 82,0 | 30 | 928,1 | 868,1 | 1125,0 | 3,737 | 4,230 | ✓ | ✓ | ✓ | ✓ | - |
| W 1000 x 400 x 748 | 40 | 748 | 1068 | 417 | 39,0 | 70,0 | 30 | 928,1 | 868,1 | 953,0 | 3,674 | 4,909 | ✓ | ✓ | ✓ | ✓ | - |
| W 1000 x 400 x 642 | 40 | 642 | 1048 | 412 | 34,0 | 60,0 | 30 | 928,1 | 868,1 | 818,0 | 3,624 | 5,646 | ✓ | ✓ | ✓ | ✓ | - |
| W 1000 x 400 x 591 | 40 | 591 | 1040 | 409 | 31,0 | 55,9 | 30 | 928,1 | 868,1 | 753,0 | 3,602 | 6,096 | ✓ | ✓ | ✓ | ✓ | - |
| W 1000 x 400 x 554 | 40 | 554 | 1032 | 408 | 29,5 | 52,0 | 30 | 928,1 | 868,1 | 706,0 | 3,585 | 6,470 | ✓ | ✓ | ✓ | - | - |
| W 1000 x 400 x 539 | 40 | 539 | 1030 | 407 | 28,4 | 51,1 | 30 | 928,1 | 868,1 | 687,0 | 3,580 | 6,637 | ✓ | ✓ | ✓ | - | - |
| W 1000 x 400 x 483 | 40 | 483 | 1020 | 404 | 25,4 | 46,0 | 30 | 928,1 | 868,1 | 615,0 | 3,554 | 7,360 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 400 x 443 | 40 | 443 | 1012 | 402 | 23,6 | 41,9 | 30 | 928,1 | 868,1 | 564,0 | 3,533 | 7,985 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 400 x 412 | 40 | 412 | 1008 | 402 | 21,1 | 40,0 | 30 | 928,1 | 868,1 | 525,0 | 3,530 | 8,563 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 400 x 371 | 40 | 371 | 1000 | 400 | 19,0 | 36,1 | 30 | 928,1 | 868,1 | 473,0 | 3,510 | 9,457 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 400 x 321 | 40 | 321 | 990 | 400 | 16,5 | 31,0 | 30 | 928,1 | 868,1 | 408,0 | 3,495 | 10,89 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 400 x 296 | 40 | 296 | 982 | 400 | 16,5 | 27,1 | 30 | 928,1 | 868,1 | 377,0 | 3,479 | 11,74 | ✓ | ✓ | ✓ | - | ✓ |

| | | | | | | | | | | | | | | | | | |
|--------------------|----|-----|------|-----|------|------|----|-------|-------|-------|-------|-------|---|---|---|---|---|
| W 1000 x 300 x 584 | 40 | 584 | 1056 | 314 | 36,0 | 64,0 | 30 | 928,1 | 868,1 | 744,0 | 3,244 | 5,560 | ✓ | ✓ | ✓ | ✓ | - |
| W 1000 x 300 x 494 | 40 | 494 | 1036 | 309 | 31,0 | 54,0 | 30 | 928,1 | 868,1 | 629,0 | 3,194 | 6,467 | ✓ | ✓ | ✓ | ✓ | - |
| W 1000 x 300 x 486 | 40 | 486 | 1036 | 308 | 30,0 | 54,1 | 30 | 928,1 | 868,1 | 619,0 | 3,192 | 6,566 | ✓ | ✓ | ✓ | - | - |
| W 1000 x 300 x 438 | 40 | 438 | 1026 | 305 | 26,9 | 49,0 | 30 | 928,1 | 868,1 | 556,0 | 3,167 | 7,253 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 300 x 415 | 40 | 415 | 1020 | 304 | 26,0 | 46,0 | 30 | 928,1 | 868,1 | 528,0 | 3,152 | 7,595 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 300 x 393 | 40 | 393 | 1016 | 303 | 24,4 | 43,9 | 30 | 928,1 | 868,1 | 501,0 | 3,144 | 8,006 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 300 x 350 | 40 | 350 | 1008 | 302 | 21,1 | 40,0 | 30 | 928,1 | 868,1 | 446,0 | 3,130 | 8,957 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 300 x 314 | 40 | 314 | 1000 | 300 | 19,1 | 35,9 | 30 | 928,1 | 868,1 | 400,0 | 3,110 | 9,894 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 300 x 272 | 40 | 272 | 990 | 300 | 16,5 | 31,0 | 30 | 928,1 | 868,1 | 346,0 | 3,095 | 11,37 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 300 x 249 | 40 | 249 | 980 | 300 | 16,5 | 26,0 | 30 | 928,1 | 868,1 | 317,0 | 3,075 | 12,36 | ✓ | ✓ | ✓ | - | ✓ |
| W 1000 x 300 x 222 | 40 | 222 | 970 | 300 | 16,0 | 21,1 | 30 | 928,1 | 868,1 | 282,0 | 3,056 | 13,77 | ✓ | ✓ | - | - | ✓ |

40 Minimum order: 40t per section and grade or upon agreement.
☎ Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo
☎ Plazo mínimo y condiciones de entrega previo acuerdo

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.
☎ Minimalny tonaż i warunki dostawy po uzgodnieniu.



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | | |
|---|---|-----------------|-----------------|-----------|-----------------|-----------------|---|-----------------|-----------|-------|-----------------|-------------------------------------|-------------------------------------|----------|-------------|----------|--|--------------------------|--------------------------|--------------------------|--------------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | G | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/ Seiten | 4 faces/sides/ Seiten | 3 faces/sides/ Seiten | 4 faces/sides/ Seiten |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x10 ³ | | | | | | | | | |
| W 44 x 16 x 408 | 408 | 1624100 | 28540 | 33000 | 45,7 | 376,4 | 63470 | 3096 | 4886 | 9,0 | 17,6 | 5789 | 185250 | c | c | nsl | nsl | 44 | 49 | 35 | 40 |
| W 44 x 16 x 368 | 368 | 1456640 | 25820 | 29720 | 45,5 | 339,5 | 56400 | 2771 | 4358 | 8,9 | 16,3 | 4344 | 163220 | c | c | nsl | nsl | 48 | 54 | 38 | 44 |
| W 44 x 16 x 335 | 335 | 1305020 | 23340 | 26810 | 45,1 | 313,7 | 50000 | 2469 | 3879 | 8,8 | 15,1 | 3253 | 143400 | c | c | nsl | nsl | 52 | 59 | 41 | 48 |
| W 44 x 16 x 290 | 290 | 1136540 | 20510 | 23370 | 45,2 | 266,6 | 43420 | 2160 | 3370 | 8,8 | 13,7 | 2229 | 123500 | c | c | nsl | nsl | 60 | 67 | 47 | 54 |
| W 44 x 16 x 262 | 262 | 1016360 | 18470 | 20990 | 45,0 | 242,1 | 38490 | 1924 | 2995 | 8,7 | 12,7 | 1649 | 108680 | c | c | nsl | nsl | 66 | 74 | 52 | 60 |
| W 44 x 16 x 230 | 230 | 878350 | 16110 | 18270 | 44,6 | 216,9 | 33130 | 1656 | 2575 | 8,6 | 11,5 | 1104 | 92700 | c | c | nsl | sl | 75 | 84 | 59 | 68 |
| W 40 x 16 x 655 | 655 | 2348680 | 42390 | 50290 | 43,4 | 570,7 | 118520 | 5538 | 8838 | 9,7 | 26,4 | 24410 | 304410 | c | c | nsl | nsl | 27 | 30 | 21 | 25 |
| W 40 x 16 x 593 | 593 | 2096410 | 38390 | 45260 | 43,1 | 516,4 | 104970 | 4951 | 7873 | 9,6 | 24,4 | 18510 | 265670 | c | c | nsl | nsl | 29 | 33 | 23 | 27 |
| W 40 x 16 x 503 | 503 | 1731940 | 32430 | 37880 | 42,6 | 438,9 | 85110 | 4082 | 6459 | 9,4 | 21,4 | 11550 | 210640 | c | c | nsl | nsl | 34 | 39 | 27 | 31 |
| W 40 x 16 x 431 | 431 | 1450580 | 27680 | 32090 | 42,1 | 379,6 | 70280 | 3411 | 5378 | 9,2 | 18,9 | 7381 | 170660 | c | c | nsl | nsl | 39 | 44 | 31 | 36 |
| W 40 x 16 x 397 | 397 | 1331030 | 25590 | 29520 | 42,0 | 346,3 | 64010 | 3130 | 4915 | 9,2 | 17,7 | 5895 | 154320 | c | c | nsl | nsl | 42 | 48 | 33 | 38 |
| W 40 x 16 x 372 | 372 | 1232370 | 23880 | 27490 | 41,7 | 328,0 | 59090 | 2896 | 4546 | 9,1 | 16,8 | 4834 | 141320 | c | c | nsl | nsl | 45 | 51 | 35 | 41 |
| W 40 x 16 x 362 | 362 | 1202530 | 23350 | 26820 | 41,8 | 316,3 | 57630 | 2832 | 4435 | 9,1 | 16,5 | 4529 | 137550 | c | c | nsl | nsl | 46 | 52 | 36 | 42 |
| W 40 x 16 x 324 | 324 | 1067480 | 20930 | 23920 | 41,6 | 282,7 | 50710 | 2510 | 3918 | 9,0 | 15,2 | 3306 | 119890 | c | c | nsl | nsl | 51 | 58 | 40 | 46 |
| W 40 x 16 x 297 | 297 | 966510 | 19100 | 21770 | 41,4 | 261,8 | 45490 | 2263 | 3529 | 8,9 | 14,2 | 2543 | 106730 | c | c | nsl | nsl | 56 | 63 | 43 | 50 |
| W 40 x 16 x 277 | 277 | 910470 | 18060 | 20460 | 41,6 | 235,9 | 43400 | 2159 | 3348 | 9,0 | 13,6 | 2144 | 101450 | c | c | nsl | nsl | 60 | 67 | 46 | 54 |
| W 40 x 16 x 249 | 249 | 813730 | 16270 | 18360 | 41,4 | 212,5 | 38580 | 1929 | 2984 | 9,0 | 12,6 | 1588 | 89440 | c | c | nsl | nsl | 66 | 74 | 51 | 59 |
| W 40 x 16 x 215 | 215 | 696440 | 14060 | 15790 | 41,2 | 184,5 | 33120 | 1656 | 2554 | 9,0 | 11,3 | 1033 | 76020 | c | c | nsl | nsl | 76 | 85 | 58 | 68 |
| W 40 x 16 x 199 | 199 | 620310 | 12630 | 14250 | 40,5 | 181,5 | 28960 | 1448 | 2242 | 8,7 | 10,5 | 763,6 | 65890 | c | c | sl | sl | 82 | 92 | 63 | 73 |
| W 40 x 12 x 392 | 392 | 1246070 | 23590 | 28030 | 40,9 | 403,2 | 33430 | 2129 | 3474 | 6,7 | 19,9 | 7153 | 81240 | c | c | nsl | nsl | 39 | 44 | 33 | 37 |
| W 40 x 12 x 331 | 331 | 1027950 | 19840 | 23410 | 40,4 | 344,5 | 26820 | 1736 | 2818 | 6,5 | 17,4 | 4395 | 64010 | c | c | nsl | nsl | 46 | 51 | 38 | 43 |
| W 40 x 12 x 327 | 327 | 1019880 | 19680 | 23170 | 40,5 | 334,7 | 26590 | 1726 | 2791 | 6,5 | 17,3 | 4293 | 63490 | c | c | nsl | nsl | 47 | 52 | 38 | 43 |
| W 40 x 12 x 294 | 294 | 909170 | 17720 | 20740 | 40,4 | 299,9 | 23350 | 1531 | 2462 | 6,4 | 16 | 3181 | 55290 | c | c | nsl | nsl | 51 | 57 | 42 | 48 |
| W 40 x 12 x 278 | 278 | 853120 | 16720 | 19570 | 40,1 | 288,5 | 21700 | 1428 | 2297 | 6,4 | 15,3 | 2703 | 51080 | c | c | nsl | nsl | 54 | 60 | 44 | 50 |
| W 40 x 12 x 264 | 264 | 807680 | 15890 | 18530 | 40,1 | 271,2 | 20490 | 1352 | 2167 | 6,4 | 14,7 | 2329 | 48080 | c | c | nsl | nsl | 57 | 63 | 47 | 53 |
| W 40 x 12 x 235 | 235 | 722960 | 14340 | 16580 | 40,3 | 235,9 | 18460 | 1222 | 1940 | 6,4 | 13,6 | 1718 | 43010 | c | c | nsl | nsl | 64 | 70 | 52 | 59 |
| W 40 x 12 x 211 | 211 | 644210 | 12880 | 14850 | 40,1 | 213,4 | 16230 | 1082 | 1712 | 6,3 | 12,6 | 1263 | 37530 | c | c | nsl | nsl | 70 | 78 | 57 | 65 |
| W 40 x 12 x 183 | 183 | 553840 | 11180 | 12820 | 39,9 | 184,5 | 14000 | 933,6 | 1469 | 6,3 | 11,3 | 834,8 | 32070 | c | c | nsl | nsl | 81 | 89 | 66 | 74 |
| W 40 x 12 x 167 | 167 | 481070 | 9817 | 11340 | 38,9 | 180,7 | 11750 | 783,6 | 1244 | 6,0 | 10,3 | 581,9 | 26620 | c | c | sl | sl | 88 | 97 | 71 | 81 |
| W 40 x 12 x 149 | 149 | 407660 | 8405 | 9803 | 37,9 | 172,2 | 9545 | 636,3 | 1020 | 5,8 | 9,3 | 390,0 | 21370 | c | c | sl | sl | 97 | 108 | 79 | 90 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

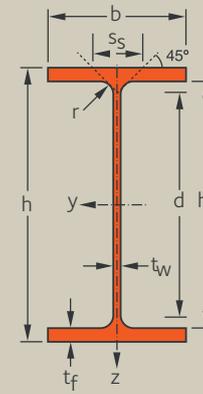
Condición de superficie: según ASTM A 6/A 6M

Dwuteowniki szerokostopowe amerykańskie (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|----|----------------|----------------|----|----------------|----|-----------------|---------------------------------------|-------------------|---------------------|---|-------------------|----------|-----------------|--|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | |
| | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50, 65 & 70 | Grade 80 | | |

| | | | | | | | | | | | | | | | | | |
|--------------------|----|------|------|-----|------|-------|----|-------|-------|--------|-------|-------|---|---|---|---|---|
| W 920 x 420 x 1377 | 40 | 1377 | 1093 | 473 | 76,7 | 115,1 | 25 | 862,8 | 812,8 | 1754,0 | 3,882 | 2,816 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 1269 | 40 | 1269 | 1093 | 461 | 64,0 | 115,1 | 25 | 862,8 | 812,8 | 1617,0 | 3,859 | 3,037 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 1194 | 40 | 1194 | 1081 | 457 | 60,5 | 109,0 | 25 | 862,8 | 812,8 | 1522,0 | 3,826 | 3,199 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 1077 | 40 | 1077 | 1061 | 451 | 55,0 | 99,1 | 25 | 862,8 | 812,8 | 1372,0 | 3,773 | 3,499 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 970 | 40 | 970 | 1043 | 446 | 50,0 | 89,9 | 25 | 862,8 | 812,8 | 1237,0 | 3,727 | 3,832 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 787 | 40 | 787 | 1011 | 437 | 40,9 | 73,9 | 25 | 862,8 | 812,8 | 1004,0 | 3,645 | 4,623 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 725 | 40 | 725 | 999 | 434 | 38,1 | 68,1 | 25 | 862,8 | 812,8 | 924,0 | 3,615 | 4,977 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 656 | 40 | 656 | 987 | 431 | 34,5 | 62,0 | 25 | 862,8 | 812,8 | 837,0 | 3,586 | 5,454 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 588 | 40 | 588 | 975 | 427 | 31,0 | 55,9 | 25 | 862,8 | 812,8 | 750,0 | 3,553 | 6,032 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 537 | 40 | 537 | 965 | 425 | 28,4 | 51,1 | 25 | 862,8 | 812,8 | 685,0 | 3,530 | 6,567 | ✓ | ✓ | ✓ | - | - |
| W 920 x 420 x 491 | 40 | 491 | 957 | 422 | 25,9 | 47,0 | 25 | 862,8 | 812,8 | 626,0 | 3,507 | 7,142 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 420 x 449 | 40 | 449 | 948 | 423 | 24,0 | 42,7 | 25 | 862,8 | 812,8 | 576,0 | 3,497 | 7,766 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 420 x 420 | 40 | 420 | 943 | 422 | 22,5 | 39,9 | 25 | 862,8 | 812,8 | 535,0 | 3,486 | 8,280 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 420 x 390 | 40 | 390 | 936 | 420 | 21,3 | 36,6 | 25 | 862,8 | 812,8 | 497,0 | 3,466 | 8,891 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 420 x 368 | 40 | 368 | 931 | 419 | 20,3 | 34,3 | 25 | 862,8 | 812,8 | 468,0 | 3,454 | 9,404 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 420 x 344 | 40 | 344 | 927 | 418 | 19,3 | 32,0 | 25 | 862,8 | 812,8 | 439,0 | 3,444 | 9,984 | ✓ | ✓ | ✓ | - | ✓ |

| | | | | | | | | | | | | | | | | | |
|-------------------|---|-----|-----|-----|------|------|----|-------|-------|-------|-------|-------|---|---|---|---|---|
| W 920 x 310 x 576 | ☎ | 576 | 993 | 322 | 36,1 | 65,0 | 25 | 862,8 | 812,8 | 733,2 | 3,159 | 5,471 | ✓ | ✓ | ✓ | - | - |
| W 920 x 310 x 521 | ☎ | 521 | 981 | 319 | 33,0 | 58,9 | 25 | 862,8 | 812,8 | 663,7 | 3,129 | 5,985 | ✓ | ✓ | ✓ | - | - |
| W 920 x 310 x 474 | ☎ | 474 | 971 | 316 | 30,0 | 54,1 | 25 | 862,8 | 812,8 | 603,9 | 3,103 | 6,522 | ✓ | ✓ | ✓ | - | - |
| W 920 x 310 x 425 | ☎ | 425 | 961 | 313 | 26,9 | 49,0 | 25 | 862,8 | 812,8 | 542,0 | 3,077 | 7,202 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 381 | ☎ | 381 | 951 | 310 | 24,4 | 43,9 | 25 | 862,8 | 812,8 | 486,0 | 3,050 | 7,959 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 345 | ☎ | 345 | 943 | 308 | 22,1 | 39,9 | 25 | 862,8 | 812,8 | 440,0 | 3,031 | 8,737 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 313 | ☎ | 313 | 932 | 309 | 21,1 | 34,5 | 25 | 862,8 | 812,8 | 399,0 | 3,015 | 9,586 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 289 | ☎ | 289 | 927 | 308 | 19,4 | 32,0 | 25 | 862,8 | 812,8 | 368,0 | 3,004 | 10,35 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 271 | ☎ | 271 | 923 | 307 | 18,4 | 30,0 | 25 | 862,8 | 812,8 | 346,0 | 2,994 | 10,95 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 253 | ☎ | 253 | 919 | 306 | 17,3 | 27,9 | 25 | 862,8 | 812,8 | 323,0 | 2,984 | 11,68 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 238 | ☎ | 238 | 915 | 305 | 16,5 | 25,9 | 25 | 862,8 | 812,8 | 303,0 | 2,974 | 12,39 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 223 | ☎ | 223 | 911 | 304 | 15,9 | 23,9 | 25 | 862,8 | 812,8 | 285,0 | 2,963 | 13,11 | ✓ | ✓ | ✓ | - | ✓ |
| W 920 x 310 x 201 | ☎ | 201 | 903 | 304 | 15,2 | 20,1 | 25 | 862,8 | 812,8 | 256,0 | 2,949 | 14,52 | ✓ | ✓ | - | - | ✓ |

☎ Minimum order: 40t per section and grade or upon agreement.
☎ Minimum tonnage and delivery conditions upon agreement.

☎ Pedido mínimo: 40t por sección y grado o previo acuerdo
☎ Plazo mínimo y condiciones de entrega previo acuerdo

☎ Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.
☎ Minimalny tonaż i warunki dostawy po uzgodnieniu.



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju A_p/V [m ⁻¹] | | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-------------------------------------|-------------------------------------|----------|-------------|----------|--|----------------------|----------------------|----------------------|----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiatka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x10 ³ | | | | | | | | | |
| W 36 x 16.5 x 925 | 925 | 3035400 | 55540 | 67740 | 41,5 | 812,9 | 206350 | 8725 | 14160 | 10,8 | 33,6 | 60450 | 485320 | c | c | nsl | nsl | 19 | 22 | 15 | 18 |
| W 36 x 16.5 x 853 | 853 | 2901080 | 53080 | 64020 | 42,3 | 688,7 | 189900 | 8238 | 13130 | 10,8 | 32,3 | 52120 | 449320 | c | c | nsl | nsl | 21 | 24 | 16 | 19 |
| W 36 x 16.5 x 802 | 802 | 2696760 | 49890 | 59910 | 42,0 | 647,9 | 175050 | 7660 | 12190 | 10,7 | 30,7 | 44110 | 409540 | c | c | nsl | nsl | 22 | 25 | 17 | 20 |
| W 36 x 16.5 x 723 | 723 | 2379090 | 44840 | 53450 | 41,6 | 583,9 | 152760 | 6774 | 10740 | 10,5 | 28,2 | 33050 | 350470 | c | c | nsl | nsl | 24 | 27 | 19 | 22 |
| W 36 x 16.5 x 652 | 652 | 2104260 | 40350 | 47750 | 41,2 | 526,8 | 133870 | 6003 | 9497 | 10,3 | 25,9 | 24680 | 301870 | c | c | nsl | nsl | 26 | 30 | 20 | 24 |
| W 36 x 16.5 x 529 | 529 | 1649860 | 32630 | 38110 | 40,5 | 425,5 | 103310 | 4728 | 7431 | 10,1 | 21,7 | 13650 | 225650 | c | c | nsl | nsl | 32 | 36 | 24 | 29 |
| W 36 x 16.5 x 487 | 487 | 1496530 | 29960 | 34830 | 40,2 | 394,0 | 93210 | 4295 | 6739 | 10,0 | 20,3 | 10750 | 201000 | c | c | nsl | nsl | 34 | 39 | 26 | 31 |
| W 36 x 16.5 x 441 | 441 | 1339430 | 27140 | 31360 | 39,9 | 355,4 | 83050 | 3854 | 6027 | 9,9 | 18,7 | 8098 | 176960 | c | c | nsl | nsl | 38 | 43 | 29 | 34 |
| W 36 x 16.5 x 395 | 395 | 1185310 | 24310 | 27940 | 39,7 | 318,2 | 72770 | 3408 | 5314 | 9,8 | 17,2 | 5923 | 153180 | c | c | nsl | nsl | 42 | 47 | 32 | 37 |
| W 36 x 16.5 x 361 | 361 | 1069610 | 22160 | 25360 | 39,5 | 290,4 | 65560 | 3085 | 4799 | 9,7 | 15,9 | 4542 | 136510 | c | c | nsl | nsl | 45 | 52 | 34 | 41 |
| W 36 x 16.5 x 330 | 330 | 970410 | 20280 | 23090 | 39,3 | 264,5 | 59010 | 2796 | 4339 | 9,7 | 14,9 | 3520 | 121870 | c | c | nsl | nsl | 49 | 56 | 37 | 44 |
| W 36 x 16.5 x 302 | 302 | 878790 | 18540 | 21040 | 39,1 | 243,9 | 53980 | 2552 | 3953 | 9,7 | 13,8 | 2692 | 110360 | c | c | nsl | nsl | 54 | 61 | 40 | 48 |
| W 36 x 16.5 x 282 | 282 | 817410 | 17330 | 19620 | 39,0 | 228,5 | 50070 | 2373 | 3671 | 9,6 | 13,1 | 2208 | 101890 | c | c | nsl | nsl | 57 | 65 | 43 | 51 |
| W 36 x 16.5 x 262 | 262 | 745810 | 15930 | 18010 | 38,7 | 215,2 | 45270 | 2156 | 3334 | 9,5 | 12,3 | 1741 | 91390 | c | c | nsl | nsl | 61 | 70 | 46 | 55 |
| W 36 x 16.5 x 247 | 247 | 696290 | 14950 | 16880 | 38,5 | 204,5 | 42120 | 2010 | 3108 | 9,4 | 11,8 | 1452 | 84530 | c | c | nsl | nsl | 65 | 74 | 49 | 58 |
| W 36 x 16.5 x 231 | 231 | 649060 | 14000 | 15790 | 38,4 | 194,1 | 39010 | 1866 | 2884 | 9,4 | 11,2 | 1198 | 78000 | c | c | nsl | nsl | 69 | 78 | 52 | 61 |
| W 36 x 12 x 387 | 387 | 1105790 | 22270 | 26370 | 38,7 | 372,8 | 36530 | 2269 | 3663 | 7,0 | 19,5 | 7292 | 77860 | c | c | nsl | nsl | 39 | 43 | 31 | 36 |
| W 36 x 12 x 350 | 350 | 986480 | 20110 | 23700 | 38,4 | 339,1 | 32150 | 2015 | 3243 | 6,9 | 18,0 | 5470 | 67730 | c | c | nsl | nsl | 42 | 47 | 34 | 39 |
| W 36 x 12 x 318 | 318 | 889750 | 18320 | 21480 | 38,3 | 307,4 | 28660 | 1814 | 2906 | 6,8 | 16,7 | 4210 | 59790 | c | c | nsl | nsl | 46 | 51 | 37 | 42 |
| W 36 x 12 x 286 | 286 | 792250 | 16480 | 19220 | 38,1 | 275,1 | 25200 | 1610 | 2566 | 6,8 | 15,4 | 3113 | 52070 | c | c | nsl | nsl | 51 | 57 | 41 | 47 |
| W 36 x 12 x 256 | 256 | 700850 | 14730 | 17110 | 37,8 | 248,6 | 21910 | 1414 | 2247 | 6,6 | 14,1 | 2265 | 44830 | c | c | nsl | nsl | 56 | 62 | 45 | 52 |
| W 36 x 12 x 232 | 232 | 629660 | 13350 | 15440 | 37,7 | 224,9 | 19520 | 1267 | 2006 | 6,6 | 13,1 | 1705 | 39610 | c | c | nsl | nsl | 62 | 69 | 50 | 57 |
| W 36 x 12 x 210 | 210 | 552310 | 11850 | 13720 | 37,1 | 211,9 | 17040 | 1103 | 1751 | 6,5 | 11,9 | 1206 | 34160 | c | c | nsl | nsl | 68 | 75 | 54 | 62 |
| W 36 x 12 x 194 | 194 | 508550 | 10970 | 12660 | 37,0 | 194,9 | 15640 | 1016 | 1607 | 6,5 | 11,2 | 962,1 | 31200 | c | c | nsl | nsl | 73 | 81 | 58 | 67 |
| W 36 x 12 x 182 | 182 | 475640 | 10300 | 11870 | 36,9 | 184,6 | 14520 | 946,2 | 1494 | 6,4 | 10,7 | 804,5 | 28840 | c | c | nsl | nsl | 77 | 86 | 62 | 71 |
| W 36 x 12 x 170 | 170 | 441530 | 9609 | 11050 | 36,8 | 173,4 | 13370 | 874,0 | 1378 | 6,4 | 10,2 | 657,4 | 26440 | c | c | nsl | nsl | 82 | 92 | 66 | 75 |
| W 36 x 12 x 160 | 160 | 410490 | 8972 | 10320 | 36,6 | 165,0 | 12290 | 805,9 | 1270 | 6,3 | 9,7 | 542,2 | 24200 | c | c | sl | sl | 87 | 97 | 70 | 80 |
| W 36 x 12 x 150 | 150 | 380910 | 8362 | 9635 | 36,3 | 158,3 | 11230 | 738,8 | 1166 | 6,2 | 9,2 | 446,9 | 22010 | c | c | sl | sl | 92 | 103 | 74 | 84 |
| W 36 x 12 x 135 | 135 | 329280 | 7293 | 8452 | 35,6 | 149,6 | 9447 | 621,5 | 985,6 | 6,0 | 8,4 | 311,3 | 18340 | c | c | sl | sl | 102 | 114 | 82 | 93 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

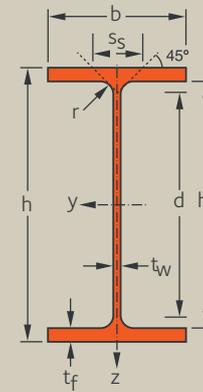
Condición de superficie: según ASTM A 6/A 6M

Dwuteowniki szerokostopowe amerykańskie (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|-----|----------------|----------------|------|----------------|-------|-----------------|---------------------------------------|-------------------|---------------------|---|-------------------|----------|-----------------|---|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50, 65 & 70 | Grade 80 | | |
| W 840 x 400 x 576 | 576 | 913 | 411 | 32,0 | 57,9 | 20 | 797,1 | 757,1 | 735,0 | 3,372 | 5,848 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 400 x 527 | 527 | 903 | 409 | 29,5 | 53,1 | 20 | 797,1 | 757,1 | 672,0 | 3,349 | 6,341 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 400 x 473 | 473 | 893 | 406 | 26,4 | 48,0 | 20 | 797,1 | 757,1 | 603,0 | 3,323 | 7,013 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 400 x 433 | 433 | 885 | 404 | 24,4 | 43,9 | 20 | 797,1 | 757,1 | 552,0 | 3,303 | 7,613 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 400 x 392 | 392 | 877 | 401 | 22,1 | 39,9 | 20 | 797,1 | 757,1 | 499,0 | 3,279 | 8,361 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 400 x 359 | 359 | 868 | 403 | 21,1 | 35,6 | 20 | 797,1 | 757,1 | 457,0 | 3,271 | 9,088 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 400 x 329 | 329 | 862 | 401 | 19,7 | 32,4 | 20 | 797,1 | 757,1 | 419,0 | 3,254 | 9,862 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 400 x 299 | 299 | 856 | 400 | 18,2 | 29,2 | 20 | 797,1 | 757,1 | 381,0 | 3,241 | 10,80 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 295 x 251 | 251 | 859 | 292 | 17,0 | 31,0 | 20 | 797,1 | 757,1 | 319,0 | 2,818 | 11,22 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 295 x 226 | 226 | 851 | 294 | 16,1 | 26,8 | 20 | 797,1 | 757,1 | 288,0 | 2,811 | 12,37 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 295 x 210 | 210 | 846 | 293 | 15,4 | 24,4 | 20 | 797,1 | 757,1 | 268,0 | 2,799 | 13,25 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 295 x 193 | 193 | 840 | 292 | 14,7 | 21,7 | 20 | 797,1 | 757,1 | 247,0 | 2,784 | 14,34 | ✓ | ✓ | ✓ | - | ✓ |
| W 840 x 295 x 176 | 176 | 835 | 292 | 14,0 | 18,8 | 20 | 797,1 | 757,1 | 224,0 | 2,776 | 15,73 | ✓ | ✓ | - | - | ✓ |
| W 760 x 380 x 582 | 582 | 843 | 396 | 34,5 | 62,0 | 20 | 719,1 | 679,1 | 742,0 | 3,167 | 5,433 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 531 | 531 | 833 | 393 | 31,5 | 56,9 | 20 | 719,1 | 679,1 | 676,0 | 3,141 | 5,908 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 484 | 484 | 823 | 390 | 29,0 | 52,1 | 20 | 719,1 | 679,1 | 617,0 | 3,114 | 6,416 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 434 | 434 | 813 | 387 | 25,9 | 47,0 | 20 | 719,1 | 679,1 | 553,0 | 3,088 | 7,108 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 389 | 389 | 803 | 385 | 23,6 | 41,9 | 20 | 719,1 | 679,1 | 495,0 | 3,064 | 7,873 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 350 | 350 | 795 | 382 | 21,1 | 38,1 | 20 | 719,1 | 679,1 | 445,0 | 3,041 | 8,682 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 314 | 314 | 786 | 384 | 19,7 | 33,4 | 20 | 719,1 | 679,1 | 400,0 | 3,034 | 9,623 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 284 | 284 | 780 | 382 | 18,0 | 30,1 | 20 | 719,1 | 679,1 | 362,0 | 3,018 | 10,59 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 380 x 257 | 257 | 772 | 381 | 16,6 | 27,1 | 20 | 719,1 | 679,1 | 328,0 | 3,000 | 11,61 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 265 x 220 | 220 | 779 | 266 | 16,5 | 30,0 | 20 | 719,1 | 679,1 | 281,0 | 2,555 | 11,56 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 265 x 196 | 196 | 770 | 268 | 15,6 | 25,4 | 20 | 719,1 | 679,1 | 251,0 | 2,546 | 12,88 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 265 x 185 | 185 | 766 | 267 | 14,9 | 23,6 | 20 | 719,1 | 679,1 | 235,0 | 2,536 | 13,66 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 265 x 173 | 173 | 762 | 267 | 14,4 | 21,6 | 20 | 719,1 | 679,1 | 221,0 | 2,529 | 14,49 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 265 x 161 | 161 | 758 | 266 | 13,8 | 19,3 | 20 | 719,1 | 679,1 | 205,0 | 2,518 | 15,62 | ✓ | ✓ | ✓ | - | ✓ |
| W 760 x 265 x 147 | 147 | 753 | 265 | 13,2 | 17,0 | 20 | 719,1 | 679,1 | 188,0 | 2,505 | 16,93 | ✓ | ✓ | - | - | ✓ |
| W 760 x 265 x 134 | 134 | 750 | 264 | 11,9 | 15,5 | 20 | 719,1 | 679,1 | 170,0 | 2,498 | 18,63 | ✓ | ✓ | - | - | ✓ |

40 Minimum order: 40t per section and grade or upon agreement.
Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.
Plazo mínimo y condiciones de entrega previo acuerdo

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.
Minimalny tonaż i warunki dostawy po uzgodnieniu.



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-------------------------------------|-------------------------------------|----------|-------------|----------|--|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{Vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x10 ³ | | | | | | | | | |
| W 33 x 15.75 x 387 | 387 | 1011770 | 22160 | 25560 | 37,1 | 300,2 | 67220 | 3271 | 5101 | 9,5 | 17,1 | 6167 | 122460 | c | c | nsl | nsl | 40 | 46 | 30 | 36 |
| W 33 x 15.75 x 354 | 354 | 915080 | 20260 | 23270 | 36,8 | 275,3 | 60730 | 2969 | 4621 | 9,5 | 15,9 | 4777 | 109340 | c | c | nsl | nsl | 44 | 50 | 33 | 39 |
| W 33 x 15.75 x 318 | 318 | 813200 | 18210 | 20790 | 36,7 | 245,7 | 53670 | 2643 | 4100 | 9,4 | 14,5 | 3511 | 95560 | c | c | nsl | nsl | 48 | 55 | 36 | 43 |
| W 33 x 15.75 x 291 | 291 | 736270 | 16630 | 18920 | 36,4 | 226,2 | 48350 | 2393 | 3706 | 9,3 | 13,5 | 2704 | 85320 | c | c | nsl | nsl | 52 | 60 | 39 | 47 |
| W 33 x 15.75 x 263 | 263 | 659650 | 15040 | 17040 | 36,3 | 204,3 | 42960 | 2142 | 3310 | 9,2 | 12,5 | 2026 | 75110 | c | c | nsl | nsl | 58 | 66 | 43 | 51 |
| W 33 x 15.75 x 241 | 241 | 591620 | 13630 | 15420 | 35,9 | 193,3 | 38900 | 1930 | 2984 | 9,2 | 11,5 | 1510 | 67260 | c | c | nsl | nsl | 63 | 71 | 47 | 55 |
| W 33 x 15.75 x 221 | 221 | 535820 | 12430 | 14040 | 35,7 | 179,8 | 34870 | 1739 | 2687 | 9,1 | 10,7 | 1159 | 59910 | c | c | nsl | nsl | 68 | 77 | 51 | 60 |
| W 33 x 15.75 x 201 | 201 | 481680 | 11250 | 12680 | 35,5 | 165,5 | 31190 | 1559 | 2406 | 9,0 | 10,0 | 866,2 | 53220 | c | c | nsl | nsl | 74 | 85 | 55 | 66 |
| W 33 x 11.5 x 169 | 169 | 387490 | 9021 | 10320 | 34,8 | 156,5 | 12900 | 883,7 | 1383 | 6,3 | 10,2 | 745,5 | 22040 | c | c | nsl | nsl | 79 | 88 | 63 | 72 |
| W 33 x 11.5 x 152 | 152 | 341070 | 8015 | 9188 | 34,3 | 146,8 | 11380 | 774,4 | 1214 | 6,2 | 9,3 | 522,6 | 19270 | c | c | nsl | nsl | 87 | 97 | 69 | 79 |
| W 33 x 11.5 x 141 | 141 | 311710 | 7369 | 8455 | 34,0 | 139,7 | 10250 | 700,2 | 1098 | 6,1 | 8,7 | 412,7 | 17260 | c | c | nsl | sl | 93 | 104 | 74 | 85 |
| W 33 x 11.5 x 130 | 130 | 279440 | 6653 | 7652 | 33,6 | 132,4 | 9030 | 618,5 | 972,2 | 6,0 | 8,1 | 311,8 | 15070 | c | c | sl | sl | 101 | 113 | 80 | 92 |
| W 33 x 11.5 x 118 | 118 | 247370 | 5925 | 6841 | 33,1 | 125,2 | 7824 | 535,9 | 844,4 | 5,8 | 7,5 | 226,8 | 12990 | c | nc | sl | sl | 110 | 123 | 87 | 100 |
| W 30 x 15 x 391 | 391 | 861550 | 20440 | 23750 | 34,0 | 297,6 | 64430 | 3254 | 5082 | 9,3 | 18,1 | 7219 | 97850 | c | c | nsl | nsl | 37 | 43 | 28 | 33 |
| W 30 x 15 x 357 | 357 | 776640 | 18640 | 21550 | 33,8 | 270,6 | 57760 | 2939 | 4579 | 9,2 | 16,8 | 5563 | 86670 | c | c | nsl | nsl | 41 | 46 | 30 | 36 |
| W 30 x 15 x 326 | 326 | 698760 | 16980 | 19530 | 33,6 | 247,8 | 51660 | 2649 | 4119 | 9,1 | 15,6 | 4279 | 76520 | c | c | nsl | nsl | 44 | 50 | 33 | 39 |
| W 30 x 15 x 292 | 292 | 618840 | 15220 | 17400 | 33,4 | 220,6 | 45510 | 2352 | 3646 | 9,0 | 14,3 | 3127 | 66600 | c | c | nsl | nsl | 49 | 56 | 36 | 43 |
| W 30 x 15 x 261 | 261 | 545190 | 13570 | 15450 | 33,1 | 199,8 | 39930 | 2074 | 3211 | 8,9 | 13,0 | 2247 | 57710 | c | c | nsl | nsl | 54 | 62 | 40 | 48 |
| W 30 x 15 x 235 | 235 | 486880 | 12240 | 13860 | 33,0 | 178,3 | 35460 | 1856 | 2865 | 8,9 | 12,0 | 1675 | 50690 | c | c | nsl | nsl | 60 | 68 | 44 | 53 |
| W 30 x 15 x 211 | 211 | 428860 | 10910 | 12320 | 32,6 | 165,0 | 31570 | 1644 | 2537 | 8,8 | 10,9 | 1182 | 44630 | c | c | nsl | nsl | 66 | 76 | 49 | 58 |
| W 30 x 15 x 191 | 191 | 383750 | 9839 | 11070 | 32,5 | 150,4 | 28000 | 1466 | 2259 | 8,7 | 10,1 | 875 | 39310 | c | c | nsl | nsl | 73 | 83 | 54 | 64 |
| W 30 x 15 x 173 | 173 | 342050 | 8861 | 9951 | 32,2 | 137,9 | 25010 | 1313 | 2020 | 8,7 | 9,4 | 651,1 | 34650 | c | c | nsl | nsl | 80 | 91 | 58 | 70 |
| W 30 x 10.5 x 148 | 148 | 279390 | 7173 | 8231 | 31,4 | 139,0 | 9443 | 710 | 1114 | 5,7 | 9,9 | 620,5 | 13190 | c | c | nsl | nsl | 81 | 91 | 65 | 74 |
| W 30 x 10.5 x 132 | 132 | 241470 | 6271 | 7207 | 30,9 | 129,7 | 8177 | 610,2 | 960,1 | 5,6 | 8,9 | 416,5 | 11290 | c | c | nsl | nsl | 90 | 101 | 72 | 82 |
| W 30 x 10.5 x 124 | 124 | 224140 | 5852 | 6724 | 30,7 | 123,4 | 7511 | 562,6 | 885,1 | 5,6 | 8,5 | 343,3 | 10310 | c | c | nsl | nsl | 96 | 107 | 76 | 87 |
| W 30 x 10.5 x 116 | 116 | 207010 | 5433 | 6251 | 30,5 | 118,6 | 6875 | 515,0 | 811,1 | 5,5 | 8,1 | 278,7 | 9390 | c | c | sl | sl | 102 | 114 | 81 | 93 |
| W 30 x 10.5 x 108 | 108 | 187250 | 4940 | 5699 | 30,1 | 113,0 | 6074 | 456,7 | 720,9 | 5,4 | 7,5 | 215,1 | 8258 | c | c | sl | sl | 110 | 123 | 87 | 100 |
| W 30 x 10.5 x 99 | 99 | 167250 | 4442 | 5143 | 29,7 | 107,3 | 5291 | 399,3 | 632 | 5,2 | 7,0 | 163,2 | 7140 | c | nc | sl | sl | 119 | 133 | 94 | 108 |
| W 30 x 10.5 x 90 | 90 | 151580 | 4042 | 4665 | 29,7 | 97,03 | 4767 | 361,1 | 569,1 | 5,2 | 6,6 | 123,7 | 6410 | nc | nc | sl | sl | 131 | 146 | 103 | 119 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

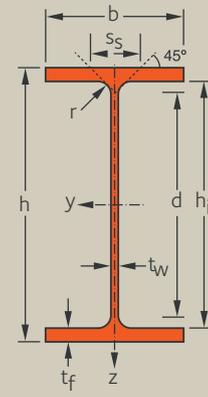
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie dwuteowniki szerokostopowe (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|-----|-----|----------------|----------------|----|----------------|-----------------|---------------------------------------|-------------------|-------------------|---|-----------------|----------|---|-----------------|
| | G | h | b | t _w | t _f | r | h _i | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | Grade 50, 65 & 70 | | | Grade 80 | | |
| W 690 x 360 x 802 | 802 | 826 | 387 | 50,0 | 89,9 | 20 | 645,9 | 605,9 | 1022,0 | 3,066 | 3,820 | ✓ | ✓ | ✓ | ✓ | - |
| W 690 x 360 x 548 | 548 | 772 | 372 | 35,1 | 63,0 | 20 | 645,9 | 605,9 | 698,0 | 2,927 | 5,335 | ✓ | ✓ | ✓ | ✓ | - |
| W 690 x 360 x 500 | 500 | 762 | 369 | 32,0 | 57,9 | 20 | 645,9 | 605,9 | 637,0 | 2,902 | 5,799 | ✓ | ✓ | ✓ | ✓ | - |
| W 690 x 360 x 457 | 457 | 752 | 367 | 29,5 | 53,1 | 20 | 645,9 | 605,9 | 582,0 | 2,879 | 6,283 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 419 | 419 | 744 | 364 | 26,9 | 49,0 | 20 | 645,9 | 605,9 | 533,0 | 2,856 | 6,814 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 384 | 384 | 736 | 362 | 24,9 | 45,0 | 20 | 645,9 | 605,9 | 489,0 | 2,836 | 7,372 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 350 | 350 | 728 | 360 | 23,1 | 40,9 | 20 | 645,9 | 605,9 | 446,0 | 2,815 | 8,019 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 323 | 323 | 722 | 359 | 21,1 | 38,1 | 20 | 645,9 | 605,9 | 411,0 | 2,803 | 8,640 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 289 | 289 | 714 | 356 | 19,0 | 34,0 | 20 | 645,9 | 605,9 | 368,0 | 2,780 | 9,617 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 265 | 265 | 706 | 358 | 18,4 | 30,2 | 20 | 645,9 | 605,9 | 337,0 | 2,773 | 10,44 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 240 | 240 | 701 | 356 | 16,8 | 27,4 | 20 | 645,9 | 605,9 | 306,0 | 2,758 | 11,44 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 360 x 217 | 217 | 695 | 355 | 15,4 | 24,8 | 20 | 645,9 | 605,9 | 277,0 | 2,745 | 12,54 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 250 x 192 | 40 192 | 702 | 254 | 15,5 | 27,9 | 20 | 645,9 | 605,9 | 244,0 | 2,355 | 12,23 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 250 x 170 | 40 170 | 693 | 256 | 14,5 | 23,6 | 20 | 645,9 | 605,9 | 216,0 | 2,347 | 13,72 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 250 x 152 | 40 152 | 688 | 254 | 13,1 | 21,1 | 20 | 645,9 | 605,9 | 194,0 | 2,331 | 15,21 | ✓ | ✓ | ✓ | - | ✓ |
| W 690 x 250 x 140 | 140 | 684 | 254 | 12,4 | 18,9 | 20 | 645,9 | 605,9 | 179,0 | 2,325 | 16,49 | ✓ | ✓ | - | - | ✓ |
| W 690 x 250 x 125 | 125 | 678 | 253 | 11,7 | 16,3 | 20 | 645,9 | 605,9 | 160,0 | 2,310 | 18,23 | ✓ | ✓ | - | - | ✓ |
| W 610 x 325 x 551 | 40 551 | 711 | 347 | 38,6 | 69,1 | 20 | 573,0 | 533,0 | 702,0 | 2,698 | 4,881 | ✓ | ✓ | ✓ | ✓ | - |
| W 610 x 325 x 498 | 40 498 | 699 | 343 | 35,1 | 63,0 | 20 | 573,0 | 533,0 | 635,0 | 2,665 | 5,332 | ✓ | ✓ | ✓ | ✓ | - |
| W 610 x 325 x 455 | 40 455 | 689 | 340 | 32,0 | 57,9 | 20 | 573,0 | 533,0 | 579,0 | 2,640 | 5,793 | ✓ | ✓ | ✓ | ✓ | - |
| W 610 x 325 x 415 | 40 415 | 679 | 338 | 29,5 | 53,1 | 20 | 573,0 | 533,0 | 529,0 | 2,617 | 6,274 | ✓ | ✓ | ✓ | - | - |
| W 610 x 325 x 372 | 40 372 | 669 | 335 | 26,4 | 48,0 | 20 | 573,0 | 533,0 | 474,0 | 2,591 | 6,930 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 341 | 40 341 | 661 | 333 | 24,4 | 43,9 | 20 | 573,0 | 533,0 | 434,0 | 2,571 | 7,518 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 307 | 40 307 | 653 | 330 | 22,1 | 39,9 | 20 | 573,0 | 533,0 | 391,0 | 2,547 | 8,246 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 285 | 40 285 | 647 | 329 | 20,6 | 37,1 | 20 | 573,0 | 533,0 | 361,0 | 2,534 | 8,831 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 262 | 40 262 | 641 | 327 | 19,0 | 34,0 | 20 | 573,0 | 533,0 | 333,0 | 2,518 | 9,585 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 241 | 40 241 | 635 | 329 | 17,9 | 31,0 | 20 | 573,0 | 533,0 | 308,0 | 2,516 | 10,34 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 217 | 40 217 | 628 | 328 | 16,5 | 27,7 | 20 | 573,0 | 533,0 | 277,0 | 2,501 | 11,39 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 195 | 40 195 | 622 | 327 | 15,4 | 24,4 | 20 | 573,0 | 533,0 | 248,0 | 2,487 | 12,61 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 174 | 40 174 | 616 | 325 | 14,0 | 21,6 | 20 | 573,0 | 533,0 | 222,0 | 2,470 | 14,05 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 325 x 155 | 40 155 | 611 | 324 | 12,7 | 19,0 | 20 | 573,0 | 533,0 | 197,0 | 2,458 | 15,71 | ✓ | ✓ | ✓ | - | ✓ |

40 Minimum order: 40t per section and grade or upon agreement.
Minimum tonnage and delivery conditions upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.
Plazo mínimo y condiciones de entrega previo acuerdo

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.
Minimalny tonaż i warunki dostawy po uzgodnieniu.



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkładniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju A_p/V [m ⁻¹] | | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-------------------------------------|-------------------------------------|----------|-------------|----------|--|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x10 ³ | | | | | | | | | |
| W 27 x 14 x 539 | 539 | 1063170 | 25740 | 30930 | 32,2 | 407,4 | 87540 | 4524 | 7146 | 9,2 | 25,3 | 20610 | 117630 | c | c | nsl | nsl | 26 | 30 | 20 | 24 |
| W 27 x 14 x 368 | 368 | 672930 | 17430 | 20380 | 31,0 | 277,4 | 54300 | 2919 | 4565 | 8,8 | 18,4 | 7065 | 67920 | c | c | nsl | nsl | 37 | 42 | 27 | 33 |
| W 27 x 14 x 336 | 336 | 606230 | 15910 | 18490 | 30,8 | 251,9 | 48670 | 2638 | 4114 | 8,7 | 17,1 | 5459 | 60090 | c | c | nsl | nsl | 40 | 46 | 30 | 35 |
| W 27 x 14 x 307 | 307 | 546550 | 14530 | 16800 | 30,6 | 230,8 | 43890 | 2392 | 3723 | 8,6 | 15,9 | 4228 | 53420 | c | c | nsl | nsl | 43 | 49 | 32 | 38 |
| W 27 x 14 x 281 | 281 | 495390 | 13310 | 15310 | 30,4 | 209,9 | 39500 | 2170 | 3369 | 8,6 | 14,8 | 3299 | 47560 | c | c | nsl | nsl | 47 | 53 | 35 | 42 |
| W 27 x 14 x 258 | 258 | 448880 | 12190 | 13960 | 30,2 | 193,4 | 35670 | 1970 | 3054 | 8,5 | 13,8 | 2569 | 42470 | c | c | nsl | nsl | 50 | 58 | 37 | 45 |
| W 27 x 14 x 235 | 235 | 403400 | 11080 | 12630 | 30,0 | 178,5 | 31870 | 1771 | 2742 | 8,4 | 12,8 | 1953 | 37530 | c | c | nsl | nsl | 55 | 63 | 41 | 49 |
| W 27 x 14 x 217 | 217 | 371040 | 10270 | 11660 | 29,9 | 162,9 | 29430 | 1640 | 2532 | 8,4 | 12,0 | 1567 | 34350 | c | c | nsl | nsl | 59 | 68 | 44 | 52 |
| W 27 x 14 x 194 | 194 | 326240 | 9138 | 10320 | 29,7 | 146,2 | 25610 | 1438 | 2217 | 8,3 | 11,0 | 1120 | 29550 | c | c | nsl | nsl | 66 | 75 | 48 | 58 |
| W 27 x 14 x 178 | 178 | 291790 | 8266 | 9333 | 29,3 | 139,8 | 23130 | 1292 | 1994 | 8,2 | 10,2 | 833,7 | 26360 | c | c | nsl | nsl | 71 | 82 | 52 | 63 |
| W 27 x 14 x 161 | 161 | 262680 | 7494 | 8433 | 29,2 | 127,5 | 20630 | 1159 | 1786 | 8,1 | 9,5 | 627,2 | 23370 | c | c | nsl | nsl | 78 | 90 | 57 | 69 |
| W 27 x 14 x 146 | 146 | 235790 | 6785 | 7613 | 29,0 | 116,5 | 18510 | 1043 | 1605 | 8,1 | 8,8 | 471,5 | 20760 | c | c | nsl | nsl | 86 | 98 | 63 | 75 |
| W 27 x 10 x 129 | 129 | 199440 | 5682 | 6504 | 28,5 | 119,0 | 7645 | 602,0 | 943 | 5,5 | 9,4 | 479,7 | 8656 | c | c | nsl | nsl | 86 | 96 | 68 | 78 |
| W 27 x 10 x 114 | 114 | 171440 | 4947 | 5665 | 28,0 | 109,9 | 6620 | 517,2 | 811,2 | 5,5 | 8,5 | 318,9 | 7392 | c | c | nsl | nsl | 96 | 108 | 75 | 87 |
| W 27 x 10 x 102 | 102 | 152100 | 4421 | 5049 | 27,9 | 99,23 | 5779 | 455,0 | 712,1 | 5,4 | 7,8 | 231,9 | 6407 | c | c | nsl | nsl | 106 | 119 | 83 | 97 |
| W 27 x 10 x 94 | 94 | 137570 | 4022 | 4596 | 27,6 | 93,46 | 5176 | 407,6 | 638,1 | 5,3 | 7,3 | 177,0 | 5708 | c | c | sl | sl | 115 | 129 | 90 | 104 |
| W 27 x 10 x 84 | 84 | 119980 | 3539 | 4056 | 27,2 | 87,37 | 4412 | 348,7 | 547,3 | 5,2 | 6,7 | 125,8 | 4815 | c | nc | sl | sl | 127 | 143 | 100 | 115 |
| W 24 x 12.75 x 370 | 370 | 559070 | 15720 | 18650 | 28,1 | 278,8 | 48410 | 2790 | 4381 | 8,2 | 20,0 | 8577 | 49560 | c | c | nsl | nsl | 33 | 38 | 25 | 30 |
| W 24 x 12.75 x 335 | 335 | 496220 | 14190 | 16720 | 27,9 | 251,8 | 42590 | 2483 | 3889 | 8,1 | 18,4 | 6477 | 42840 | c | c | nsl | nsl | 36 | 42 | 27 | 33 |
| W 24 x 12.75 x 306 | 306 | 446080 | 12940 | 15140 | 27,7 | 228,5 | 38090 | 2241 | 3500 | 8,0 | 17,1 | 5004 | 37760 | c | c | nsl | nsl | 40 | 45 | 30 | 35 |
| W 24 x 12.75 x 279 | 279 | 401320 | 11820 | 13750 | 27,4 | 209,3 | 34300 | 2030 | 3164 | 8,0 | 15,9 | 3876 | 33460 | c | c | nsl | nsl | 43 | 49 | 32 | 38 |
| W 24 x 12.75 x 250 | 250 | 354790 | 10600 | 12240 | 27,2 | 186,5 | 30170 | 1801 | 2799 | 7,9 | 14,5 | 2850 | 28990 | c | c | nsl | nsl | 47 | 54 | 35 | 42 |
| W 24 x 12.75 x 229 | 229 | 319840 | 9677 | 11120 | 27,0 | 171,5 | 27090 | 1627 | 2525 | 7,8 | 13,5 | 2195 | 25720 | c | c | nsl | nsl | 51 | 59 | 38 | 46 |
| W 24 x 12.75 x 207 | 207 | 285230 | 8736 | 9984 | 26,9 | 154,8 | 23950 | 1452 | 2247 | 7,8 | 12,5 | 1645 | 22450 | c | c | nsl | nsl | 56 | 65 | 42 | 50 |
| W 24 x 12.75 x 192 | 192 | 262280 | 8107 | 9230 | 26,7 | 143,9 | 22060 | 1341 | 2073 | 7,7 | 11,8 | 1328 | 20470 | c | c | nsl | nsl | 60 | 69 | 44 | 53 |
| W 24 x 12.75 x 176 | 176 | 237550 | 7411 | 8405 | 26,6 | 132,3 | 19850 | 1214 | 1874 | 7,7 | 11,0 | 1027 | 18250 | c | c | nsl | nsl | 65 | 75 | 48 | 58 |
| W 24 x 12.75 x 162 | 162 | 216990 | 6834 | 7726 | 26,4 | 123,9 | 18430 | 1120 | 1728 | 7,7 | 10,3 | 802,2 | 16780 | c | c | nsl | nsl | 71 | 81 | 52 | 62 |
| W 24 x 12.75 x 146 | 146 | 192360 | 6126 | 6903 | 26,2 | 113,5 | 16310 | 995,0 | 1533 | 7,6 | 9,5 | 586,1 | 14670 | c | c | nsl | nsl | 78 | 89 | 57 | 68 |
| W 24 x 12.75 x 131 | 131 | 169450 | 5448 | 6129 | 25,9 | 105,2 | 14240 | 871,0 | 1342 | 7,5 | 8,7 | 418,3 | 12690 | c | c | nsl | nsl | 86 | 99 | 63 | 76 |
| W 24 x 12.75 x 117 | 117 | 148720 | 4828 | 5417 | 25,7 | 95,28 | 12370 | 761,6 | 1172 | 7,4 | 8,0 | 297,5 | 10910 | c | c | nsl | nsl | 96 | 110 | 70 | 84 |
| W 24 x 12.75 x 104 | 104 | 130550 | 4273 | 4783 | 25,5 | 86,21 | 10780 | 665,7 | 1024 | 7,3 | 7,4 | 209,5 | 9436 | nc | nc | nsl | nsl | 107 | 123 | 78 | 94 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

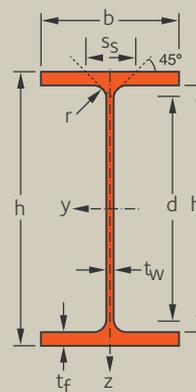
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie dwuteowniki szerokostopowe (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|--|--------------------------------------|---------|---------|----------------------|----------------------|---------|----------------------|---------|---------------------------------------|-------------------------------------|-------------------------------------|---|-----------------|-------------------|----------|-----------------|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | r mm | h _i mm | d mm | A cm ² | A _L m ² /m | A _G m ² /t | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B |
| | | | | | | | | | | | | | | Grade 50, 65 & 70 | Grade 80 | |
| W 610 x 230 x 153 40 | 153 | 623 | 229 | 14,0 | 24,9 | 20 | 573,0 | 533,0 | 196,0 | 2,100 | 13,53 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 230 x 140 | 140 | 617 | 230 | 13,1 | 22,2 | 20 | 573,0 | 533,0 | 179,0 | 2,093 | 14,77 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 230 x 125 | 125 | 612 | 229 | 11,9 | 19,6 | 20 | 573,0 | 533,0 | 159,0 | 2,082 | 16,44 | ✓ | ✓ | ✓ | - | ✓ |
| W 610 x 230 x 113 | 113 | 608 | 228 | 11,2 | 17,3 | 20 | 573,0 | 533,0 | 145,0 | 2,071 | 18,00 | ✓ | ✓ | - | - | ✓ |
| W 610 x 230 x 101 | 101 | 603 | 228 | 10,5 | 14,9 | 20 | 573,0 | 533,0 | 130,0 | 2,063 | 19,98 | ✓ | ✓ | - | - | ✓ |
| W 610 x 180 x 92 | 92 | 603 | 179 | 10,9 | 15,0 | 13 | 573,0 | 547,0 | 117,0 | 1,878 | 20,34 | ✓ | ✓ | - | - | - |
| W 610 x 180 x 82 | 82 | 599 | 178 | 10,0 | 12,8 | 13 | 573,0 | 547,0 | 105,0 | 1,868 | 22,80 | ✓ | ✓ | - | - | - |
| W 530 x 210 x 138 | 138 | 549 | 214 | 14,7 | 23,6 | 13 | 501,9 | 475,9 | 176,0 | 1,902 | 13,75 | ✓ | ✓ | - | - | ✓ |
| W 530 x 210 x 123 40 | 123 | 544 | 212 | 13,1 | 21,2 | 13 | 501,9 | 475,9 | 157,0 | 1,887 | 15,31 | ✓ | ✓ | - | - | ✓ |
| W 530 x 210 x 109 40 | 109 | 539 | 211 | 11,6 | 18,8 | 13 | 501,9 | 475,9 | 139,0 | 1,876 | 17,20 | ✓ | ✓ | - | - | ✓ |
| W 530 x 210 x 101 | 101 | 537 | 210 | 10,9 | 17,4 | 13 | 501,9 | 475,9 | 129,0 | 1,870 | 18,43 | ✓ | ✓ | - | - | ✓ |
| W 530 x 210 x 92 | 92 | 533 | 209 | 10,2 | 15,6 | 13 | 501,9 | 475,9 | 118,0 | 1,859 | 20,10 | ✓ | ✓ | - | - | ✓ |
| W 530 x 210 x 82 | 82 | 528 | 209 | 9,5 | 13,3 | 13 | 501,9 | 475,9 | 105,0 | 1,851 | 22,53 | ✓ | ✓ | - | - | ✓ |
| W 530 x 210 x 72 | 72 | 524 | 207 | 9,0 | 10,9 | 13 | 501,9 | 475,9 | 91,8 | 1,836 | 25,48 | ✓ | ✓ | - | - | ✓ |
| W 530 x 165 x 85 | 85 | 535 | 166 | 10,3 | 16,5 | 13 | 501,9 | 475,9 | 108,0 | 1,691 | 19,96 | ✓ | ✓ | - | - | ✓ |
| W 530 x 165 x 74 | 74 | 529 | 166 | 9,7 | 13,6 | 13 | 501,9 | 475,9 | 94,8 | 1,680 | 22,46 | ✓ | ✓ | - | - | ✓ |
| W 530 x 165 x 66 | 66 | 525 | 165 | 8,9 | 11,4 | 13 | 501,9 | 475,9 | 83,9 | 1,670 | 25,40 | ✓ | ✓ | - | - | ✓ |
| W 460 x 280 x 260 40 | 260 | 509 | 289 | 22,6 | 40,4 | 20 | 428,0 | 388,0 | 331,0 | 2,094 | 7,993 | ✓ | ✓ | - | - | - |
| W 460 x 280 x 235 40 | 235 | 501 | 287 | 20,6 | 36,6 | 20 | 428,0 | 388,0 | 299,0 | 2,074 | 8,759 | ✓ | ✓ | - | - | - |
| W 460 x 280 x 213 40 | 213 | 495 | 285 | 18,5 | 33,5 | 20 | 428,0 | 388,0 | 271,0 | 2,059 | 9,588 | ✓ | ✓ | - | - | - |
| W 460 x 280 x 193 40 | 193 | 489 | 283 | 17,0 | 30,5 | 20 | 428,0 | 388,0 | 247,0 | 2,042 | 10,45 | ✓ | ✓ | - | - | ✓ |
| W 460 x 280 x 177 40 | 177 | 482 | 286 | 16,6 | 26,9 | 20 | 428,0 | 388,0 | 226,0 | 2,040 | 11,38 | ✓ | ✓ | - | - | ✓ |
| W 460 x 280 x 158 40 | 158 | 476 | 284 | 15,0 | 23,9 | 20 | 428,0 | 388,0 | 201,0 | 2,024 | 12,68 | ✓ | ✓ | - | - | ✓ |
| W 460 x 280 x 144 40 | 144 | 472 | 283 | 13,6 | 22,1 | 20 | 428,0 | 388,0 | 184,0 | 2,014 | 13,74 | ✓ | ✓ | - | - | ✓ |
| W 460 x 280 x 128 | 128 | 467 | 282 | 12,2 | 19,6 | 20 | 428,0 | 388,0 | 163,0 | 2,003 | 15,36 | ✓ | ✓ | - | - | ✓ |
| W 460 x 280 x 113 | 113 | 463 | 280 | 10,8 | 17,3 | 20 | 428,0 | 388,0 | 144,0 | 1,990 | 17,29 | ✓ | ✓ | - | - | ✓ |
| W 460 x 190 x 106 40 | 106 | 469 | 194 | 12,6 | 20,6 | 10 | 428,0 | 408,0 | 134,0 | 1,672 | 15,81 | ✓ | ✓ | - | - | ✓ |
| W 460 x 190 x 97 | 97 | 466 | 193 | 11,4 | 19,0 | 10 | 428,0 | 408,0 | 123,0 | 1,664 | 17,24 | ✓ | ✓ | - | - | ✓ |
| W 460 x 190 x 89 | 89 | 463 | 192 | 10,5 | 17,7 | 10 | 428,0 | 408,0 | 114,0 | 1,656 | 18,55 | ✓ | ✓ | - | - | ✓ |
| W 460 x 190 x 82 | 82 | 460 | 191 | 9,9 | 16,0 | 10 | 428,0 | 408,0 | 105,0 | 1,647 | 20,11 | ✓ | ✓ | - | - | ✓ |
| W 460 x 190 x 74 | 74 | 457 | 190 | 9,0 | 14,5 | 10 | 428,0 | 408,0 | 94,8 | 1,639 | 22,10 | ✓ | ✓ | - | - | ✓ |
| W 460 x 190 x 67 ♦ | 67 | 454 | 190 | 8,5 | 12,7 | 10 | 428,0 | 408,0 | 85,5 | 1,634 | 24,33 | ✓ | ✓ | - | - | ✓ |

40 Minimum order: 40t per section and grade or upon agreement.
 Minimum tonnage and delivery conditions upon agreement.
 ♦ Dimensions ArcelorMittal standard

40 Pedido mínimo: 40t por sección y grado o previo acuerdo
 Plazo mínimo y condiciones de entrega previo acuerdo
 ♦ Dimensiones estándar de ArcelorMittal

40 Minimalne zamówienie: 40t dla każdego rodzaju profili oraz klas lub po uzgodnieniu.
 Minimalny tonaż i warunki dostawy po uzgodnieniu.
 ♦ Wymiary standard ArcelorMittal



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosiniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V (m ⁻¹) | | | | |
|---|---|------------------|------------------|----------------|-----------------|-----------------|---|------------------|----------------|----------------|-----------------|-------------------------------------|-------------------------------------|----------|-------------|----------|---|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x10 ³ | | | | | | | | | |
| W 24 x 9 x 103 | 103 | 126750 | 4069 | 4657 | 25,3 | 97,12 | 5001 | 436,8 | 684,9 | 5,0 | 8,7 | 315,8 | 4456 | c | c | nsl | nsl | 95 | 106 | 75 | 86 |
| W 24 x 9 x 94 | 94 | 113580 | 3681 | 4207 | 25,0 | 90,23 | 4517 | 392,7 | 615,5 | 5,0 | 8,0 | 235,5 | 3981 | c | c | nsl | nsl | 103 | 116 | 81 | 94 |
| W 24 x 9 x 84 | 84 | 100150 | 3272 | 3731 | 24,9 | 81,76 | 3935 | 343,6 | 537,7 | 4,9 | 7,4 | 168,2 | 3441 | c | c | nsl | nsl | 115 | 129 | 90 | 104 |
| W 24 x 9 x 76 | 76 | 89160 | 2933 | 3347 | 24,6 | 76,51 | 3428 | 300,7 | 471,1 | 4,8 | 6,9 | 123,9 | 2981 | c | c | sl | sl | 126 | 141 | 99 | 114 |
| W 24 x 9 x 68 | 68 | 77970 | 2586 | 2957 | 24,3 | 71,14 | 2952 | 258,9 | 406,4 | 4,7 | 6,3 | 87,85 | 2544 | c | c | sl | sl | 139 | 157 | 109 | 126 |
| W 24 x 7 x 62 | 62 | 64680 | 2145 | 2514 | 23,4 | 69,44 | 1441 | 161,0 | 258,5 | 3,5 | 5,6 | 71,30 | 1239 | c | c | sl | sl | 144 | 160 | 118 | 133 |
| W 24 x 7 x 55 | 55 | 56030 | 1870 | 2198 | 23,1 | 63,39 | 1208 | 135,8 | 218,2 | 3,4 | 5,0 | 49,07 | 1033 | c | c | sl | sl | 162 | 179 | 132 | 149 |
| W 21 x 8.25 x 93 | 93 | 86120 | 3137 | 3614 | 22,1 | 84,82 | 3869 | 361,6 | 568,9 | 4,6 | 7,7 | 250,9 | 2660 | c | c | nsl | nsl | 96 | 108 | 74 | 87 |
| W 21 x 8.25 x 83 | 83 | 76120 | 2798 | 3209 | 22,0 | 75,44 | 3377 | 318,6 | 499,2 | 4,6 | 7,0 | 180,9 | 2300 | c | c | nsl | nsl | 107 | 120 | 83 | 96 |
| W 21 x 8.25 x 73 | 73 | 66770 | 2477 | 2828 | 21,9 | 66,68 | 2951 | 279,7 | 436,6 | 4,6 | 6,4 | 126,8 | 1991 | c | c | nsl | nsl | 120 | 135 | 93 | 108 |
| W 21 x 8.25 x 68 | 68 | 61740 | 2299 | 2621 | 21,8 | 62,61 | 2692 | 256,4 | 399,7 | 4,5 | 6,0 | 102,0 | 1812 | c | c | nsl | nsl | 128 | 145 | 99 | 116 |
| W 21 x 8.25 x 62 | 62 | 55280 | 2074 | 2365 | 21,6 | 58,28 | 2379 | 227,6 | 354,9 | 4,4 | 5,6 | 76,47 | 1588 | c | c | nsl | sl | 140 | 158 | 108 | 126 |
| W 21 x 8.25 x 55 | 55 | 47690 | 1806 | 2063 | 21,3 | 53,80 | 2028 | 194,0 | 302,9 | 4,4 | 5,1 | 52,01 | 1340 | c | nc | sl | sl | 157 | 177 | 121 | 141 |
| W 21 x 8.25 x 48 | 48 | 40090 | 1530 | 1761 | 20,9 | 50,46 | 1615 | 156,0 | 244,7 | 4,1 | 4,6 | 34,01 | 1060 | nc | nc | sl | sl | 177 | 200 | 137 | 159 |
| W 21 x 6.5 x 57 | 57 | 48580 | 1816 | 2105 | 21,2 | 59,14 | 1263 | 152,2 | 241,8 | 3,4 | 5,8 | 73,98 | 845,4 | c | c | nsl | nsl | 141 | 157 | 115 | 130 |
| W 21 x 6.5 x 50 | 50 | 41090 | 1553 | 1810 | 20,7 | 54,98 | 1041 | 125,4 | 200,3 | 3,3 | 5,2 | 48,20 | 688,5 | c | c | sl | sl | 159 | 176 | 128 | 146 |
| W 21 x 6.5 x 44 | 44 | 35100 | 1337 | 1563 | 20,4 | 50,12 | 857,3 | 103,9 | 166,1 | 3,1 | 4,6 | 32,15 | 562,8 | c | c | sl | sl | 180 | 199 | 145 | 165 |
| W 18 x 11 x 175 | 175 | 144800 | 5689 | 6579 | 20,8 | 125,4 | 16300 | 1128 | 1747 | 6,9 | 12,6 | 1478 | 8922 | c | c | nsl | nsl | 54 | 63 | 39 | 48 |
| W 18 x 11 x 158 | 158 | 128450 | 5127 | 5892 | 20,6 | 113,7 | 14450 | 1007 | 1557 | 6,9 | 11,7 | 1106 | 7774 | c | c | nsl | nsl | 59 | 69 | 43 | 52 |
| W 18 x 11 x 143 | 143 | 115440 | 4664 | 5325 | 20,5 | 102,2 | 12950 | 909,0 | 1401 | 6,8 | 10,8 | 843,0 | 6881 | c | c | nsl | nsl | 65 | 75 | 47 | 57 |
| W 18 x 11 x 130 | 130 | 103470 | 4232 | 4808 | 20,3 | 93,57 | 11540 | 815,9 | 1256 | 6,8 | 10,1 | 641,1 | 6055 | c | c | nsl | nsl | 71 | 82 | 51 | 62 |
| W 18 x 11 x 119 | 119 | 92130 | 3823 | 4334 | 20,0 | 89,74 | 10510 | 735,0 | 1134 | 6,7 | 9,3 | 472,6 | 5430 | c | c | nsl | nsl | 77 | 89 | 55 | 67 |
| W 18 x 11 x 106 | 106 | 80750 | 3393 | 3828 | 19,9 | 80,80 | 9141 | 643,7 | 992,0 | 6,7 | 8,6 | 337,2 | 4662 | c | c | nsl | nsl | 86 | 99 | 61 | 75 |
| W 18 x 11 x 97 | 97 | 73720 | 3124 | 3507 | 19,8 | 73,46 | 8362 | 590,9 | 908,6 | 6,6 | 8,1 | 265,6 | 4224 | c | c | nsl | nsl | 93 | 108 | 66 | 81 |
| W 18 x 11 x 86 | 86 | 64810 | 2776 | 3102 | 19,7 | 65,85 | 7336 | 520,3 | 798,8 | 6,6 | 7,4 | 189,1 | 3665 | c | c | nsl | nsl | 104 | 121 | 73 | 90 |
| W 18 x 11 x 76 | 76 | 56720 | 2450 | 2726 | 19,6 | 58,48 | 6337 | 452,7 | 694,0 | 6,5 | 6,8 | 132,3 | 3143 | nc | nc | nsl | nsl | 117 | 136 | 82 | 101 |
| W 18 x 7.5 x 71 | 71 | 48800 | 2081 | 2386 | 19,0 | 61,47 | 2514 | 259,2 | 405,3 | 4,3 | 6,5 | 145,5 | 1260 | c | c | nsl | nsl | 110 | 124 | 84 | 98 |
| W 18 x 7.5 x 65 | 65 | 44490 | 1909 | 2179 | 19,0 | 55,61 | 2282 | 236,5 | 368,4 | 4,3 | 6,1 | 112,8 | 1137 | c | c | nsl | nsl | 120 | 135 | 91 | 107 |
| W 18 x 7.5 x 60 | 60 | 40930 | 1768 | 2011 | 18,9 | 51,15 | 2092 | 217,9 | 338,6 | 4,2 | 5,7 | 90,54 | 1035 | c | c | nsl | nsl | 129 | 146 | 98 | 115 |
| W 18 x 7.5 x 55 | 55 | 36980 | 1608 | 1828 | 18,8 | 48,01 | 1862 | 194,9 | 302,9 | 4,2 | 5,3 | 68,97 | 915,7 | c | c | nsl | nsl | 140 | 158 | 106 | 125 |
| W 18 x 7.5 x 50 | 50 | 33240 | 1455 | 1649 | 18,7 | 43,58 | 1660 | 174,8 | 270,9 | 4,1 | 4,9 | 51,59 | 811,4 | c | c | nsl | nsl | 153 | 173 | 117 | 137 |
| W 18 x 7.5 x 45 | 45 | 29460 | 1298 | 1473 | 18,5 | 40,90 | 1454 | 153,0 | 237,5 | 4,1 | 4,5 | 37,05 | 706,8 | c | c | nsl | nsl | 169 | 191 | 128 | 151 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

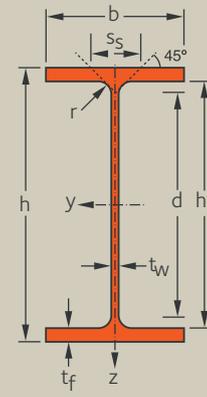
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie dwuteowniki szerokostopowe (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|-----|----------------|----------------|-------|----------------|-------|-----------------|---------------------------------------|-------------------|---------------------|---|-------------------|----------|-----------------|---|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50, 65 & 70 | Grade 80 | | |
| W 460 x 150 x 68 | 68 | 459 | 154 | 9,1 | 15,4 | 10 | 428,0 | 408,0 | 87,1 | 1,499 | 21,88 | ✓ | ✓ | - | - | ✓ |
| W 460 x 150 x 60 | 60 | 455 | 153 | 8,0 | 13,3 | 10 | 428,0 | 408,0 | 76,1 | 1,489 | 25,01 | ✓ | ✓ | - | - | ✓ |
| W 460 x 150 x 52 | 52 | 450 | 152 | 7,6 | 10,8 | 10 | 428,0 | 408,0 | 66,5 | 1,476 | 28,38 | ✓ | ✓ | - | - | ✓ |
| W 410 x 260 x 149 | 149 | 431 | 265 | 14,9 | 25,0 | 10 | 381,0 | 361,0 | 190,0 | 1,875 | 12,56 | ✓ | ✓ | - | - | - |
| W 410 x 260 x 132 | 132 | 425 | 263 | 13,3 | 22,2 | 10 | 381,0 | 361,0 | 169,0 | 1,858 | 14,07 | ✓ | ✓ | - | - | ✓ |
| W 410 x 260 x 114 | 114 | 420 | 261 | 11,6 | 19,3 | 10 | 381,0 | 361,0 | 146,0 | 1,844 | 16,11 | ✓ | ✓ | - | - | ✓ |
| W 410 x 260 x 100 | 100 | 415 | 260 | 10,0 | 16,9 | 10 | 381,0 | 361,0 | 127,0 | 1,833 | 18,41 | ✓ | ✓ | - | - | ✓ |
| W 410 x 180 x 85 | 85 | 417 | 181 | 10,9 | 18,2 | 10 | 381,0 | 361,0 | 108,0 | 1,519 | 17,88 | ✓ | ✓ | - | - | ✓ |
| W 410 x 180 x 75 | 75 | 413 | 180 | 9,7 | 16,0 | 10 | 381,0 | 361,0 | 94,8 | 1,509 | 20,15 | ✓ | ✓ | - | - | ✓ |
| W 410 x 180 x 67 | 67 | 410 | 179 | 8,8 | 14,4 | 10 | 381,0 | 361,0 | 85,8 | 1,501 | 22,25 | ✓ | ✓ | - | - | ✓ |
| W 410 x 180 x 60 | 60 | 407 | 178 | 7,7 | 12,8 | 10 | 381,0 | 361,0 | 76,1 | 1,493 | 25,09 | ✓ | ✓ | - | - | ✓ |
| W 410 x 180 x 53 | 53 | 403 | 177 | 7,5 | 10,9 | 10 | 381,0 | 361,0 | 68,4 | 1,482 | 27,75 | ✓ | ✓ | - | - | ✓ |
| W 410 x 140 x 53,3 | 53,3 | 407 | 143 | 7,9 | 12,9 | 10 | 388,0 | 361,0 | 67,9 | 1,353 | 25,38 | ✓ | ✓ | - | - | ✓ |
| W 410 x 140 x 46,1 | 46,1 | 403 | 140 | 7,0 | 11,2 | 10 | 381,0 | 361,0 | 58,8 | 1,335 | 28,89 | ✓ | ✓ | - | - | ✓ |
| W 410 x 140 x 38,8 | 38,8 | 399 | 140 | 6,4 | 8,8 | 10 | 381,0 | 361,0 | 49,5 | 1,328 | 33,90 | ✓ | ✓ | - | - | ✓ |
| W 360 x 410 x 1 299 | 1 299 | 600 | 476 | 100,0 | 140,0 | 20 | 320,0 | 280,0 | 1 650,0 | 2,870 | 2,207 | ✓ | ✓ | ✓ | - | - |
| W 360 x 410 x 1 202 | 1 202 | 580 | 471 | 95,0 | 130,0 | 20 | 320,0 | 280,0 | 1 530,0 | 2,820 | 2,345 | ✓ | ✓ | ✓ | - | - |
| W 360 x 410 x 1 086 | 1 086 | 569 | 454 | 78,0 | 125,0 | 20 | 320,0 | 280,0 | 1 390,0 | 2,764 | 2,538 | ✓ | ✓ | ✓ | - | - |
| W 360 x 410 x 990 | 990 | 550 | 448 | 71,9 | 115,0 | 20 | 320,0 | 280,0 | 1 260,0 | 2,714 | 2,735 | ✓ | ✓ | ✓ | - | - |
| W 360 x 410 x 900 | 900 | 531 | 442 | 65,9 | 106,0 | 20 | 320,0 | 280,0 | 1 150,0 | 2,664 | 2,949 | ✓ | ✓ | ✓ | - | - |
| W 360 x 410 x 818 | 818 | 514 | 437 | 60,5 | 97,0 | 20 | 320,0 | 280,0 | 1 050,0 | 2,621 | 3,196 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 744 | 744 | 498 | 432 | 55,6 | 88,9 | 20 | 320,0 | 280,0 | 948,0 | 2,578 | 3,459 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 677 | 677 | 483 | 428 | 51,2 | 81,5 | 20 | 320,0 | 280,0 | 865,0 | 2,541 | 3,743 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 634 | 634 | 474 | 424 | 47,6 | 77,1 | 20 | 320,0 | 280,0 | 806,0 | 2,514 | 3,956 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 592 | 592 | 465 | 421 | 45,0 | 72,3 | 20 | 320,0 | 280,0 | 755,0 | 2,490 | 4,194 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 551 | 551 | 455 | 418 | 42,0 | 67,6 | 20 | 320,0 | 280,0 | 703,0 | 2,464 | 4,466 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 509 | 509 | 446 | 416 | 39,1 | 62,7 | 20 | 320,0 | 280,0 | 652,0 | 2,443 | 4,785 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 463 | 463 | 435 | 412 | 35,8 | 57,4 | 20 | 320,0 | 280,0 | 590,0 | 2,412 | 5,199 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 421 | 421 | 425 | 409 | 32,8 | 52,6 | 20 | 320,0 | 280,0 | 537,0 | 2,386 | 5,643 | ✓ | ✓ | ✓ | ✓ | - |
| W 360 x 410 x 382 | 382 | 416 | 406 | 29,8 | 48,0 | 20 | 320,0 | 280,0 | 488,0 | 2,362 | 6,159 | ✓ | ✓ | ✓ | ✓ | ✓ |
| W 360 x 410 x 347 | 347 | 407 | 404 | 27,2 | 43,7 | 20 | 320,0 | 280,0 | 442,0 | 2,341 | 6,725 | ✓ | ✓ | ✓ | ✓ | ✓ |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odknošniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | | |
|---|---|-----------------|------------------|------------------|-----------------|-----------------|---|------------------|------------------|----------------|-----------------|-----------------|-------------------------------------|----------|-------------|----------|---|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | G | I _y | W _{ely} | W _{ply} | i _y | A _{Vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| W 18 x 6 x 46 | 46 | 29680 | 1293 | 1487 | 18,4 | 44,3 | 940,5 | 122,1 | 192,0 | 3,2 | 5,1 | 50,8 | 461,1 | c | c | nsl | nsl | 154 | 172 | 123 | 141 |
| W 18 x 6 x 40 | 40 | 25480 | 1120 | 1284 | 18,3 | 38,85 | 796,1 | 104,0 | 163,0 | 3,2 | 4,6 | 33,43 | 387,2 | c | c | nsl | sl | 176 | 196 | 140 | 160 |
| W 18 x 6 x 35 | 35 | 21200 | 942,2 | 1087 | 17,8 | 36,39 | 634,0 | 83,42 | 131,4 | 3,0 | 4,0 | 20,89 | 304,8 | c | c | sl | sl | 200 | 223 | 159 | 182 |
| W 16 x 10.25 x 100 | 100 | 61840 | 2869 | 3246 | 18,0 | 66,35 | 7765 | 586,0 | 899,7 | 6,3 | 7,6 | 321,4 | 3195 | c | c | nsl | nsl | 85 | 99 | 59 | 73 |
| W 16 x 10.25 x 89 | 89 | 53820 | 2533 | 2849 | 17,8 | 58,87 | 6739 | 512,4 | 785,3 | 6,3 | 6,9 | 225,4 | 2730 | c | c | nsl | nsl | 95 | 110 | 66 | 82 |
| W 16 x 10.25 x 77 | 77 | 46130 | 2197 | 2456 | 17,7 | 51,19 | 5724 | 438,6 | 670,8 | 6,2 | 6,1 | 148,4 | 2295 | c | c | nsl | nsl | 109 | 126 | 75 | 93 |
| W 16 x 10.25 x 67 | 67 | 39760 | 1916 | 2128 | 17,7 | 44,04 | 4954 | 381,0 | 581,3 | 6,2 | 5,5 | 99,26 | 1961 | c | c | nsl | nsl | 124 | 144 | 86 | 106 |
| W 16 x 7 x 57 | 57 | 31520 | 1512 | 1724 | 17,0 | 47,96 | 1803 | 199,2 | 310,0 | 4,0 | 5,9 | 92,42 | 715,1 | c | c | nsl | nsl | 124 | 140 | 94 | 111 |
| W 16 x 7 x 50 | 50 | 27480 | 1330 | 1511 | 16,9 | 42,56 | 1558 | 173,1 | 268,7 | 4,0 | 5,3 | 63,59 | 612,7 | c | c | nsl | nsl | 139 | 158 | 105 | 124 |
| W 16 x 7 x 45 | 45 | 24540 | 1197 | 1355 | 16,8 | 38,55 | 1379 | 154,0 | 238,6 | 4,0 | 4,9 | 46,76 | 538,5 | c | c | nsl | nsl | 154 | 175 | 116 | 137 |
| W 16 x 7 x 40 | 40 | 21570 | 1060 | 1194 | 16,8 | 33,77 | 1204 | 135,3 | 208,9 | 3,9 | 4,5 | 32,69 | 467,4 | c | c | nsl | nsl | 174 | 197 | 131 | 154 |
| W 16 x 7 x 36 | 36 | 18600 | 923,1 | 1045 | 16,5 | 32,44 | 1009 | 114,0 | 176,6 | 3,8 | 4,1 | 22,48 | 387,1 | nc | nc | sl | sl | 192 | 218 | 144 | 171 |
| W 16 x 5.5 x 36 | 36 | 18270 | 898,7 | 1030 | 16,4 | 34,54 | 634,5 | 88,56 | 138,9 | 3,0 | 4,5 | 28,85 | 245,1 | c | c | nsl | nsl | 178 | 199 | 141 | 162 |
| W 16 x 5.5 x 31 | 31 | 15550 | 772,1 | 883,9 | 16,2 | 30,52 | 513,6 | 73,37 | 114,9 | 2,9 | 4,1 | 19,16 | 196,5 | c | c | sl | sl | 203 | 227 | 161 | 185 |
| W 16 x 5.5 x 26 | 26 | 12640 | 633,8 | 729,6 | 15,9 | 27,59 | 403,5 | 57,65 | 90,61 | 2,8 | 3,5 | 11,02 | 153,1 | c | nc | sl | sl | 238 | 266 | 188 | 216 |
| W 14 x 16 x 873 | 873 | 754950 | 25160 | 33260 | 21,3 | 519,4 | 254410 | 10680 | 16670 | 12,3 | 40,3 | 95520 | 133120 | c | c | nsl | nsl | 14 | 17 | 10 | 13 |
| W 14 x 16 x 808 | 808 | 663970 | 22890 | 30030 | 20,8 | 482,9 | 228760 | 9714 | 15150 | 12,2 | 37,8 | 77190 | 114600 | c | c | nsl | nsl | 15 | 18 | 11 | 14 |
| W 14 x 16 x 730 | 730 | 596070 | 20950 | 27230 | 20,7 | 399,7 | 196270 | 8646 | 13380 | 11,8 | 35,1 | 61220 | 96070 | c | c | nsl | nsl | 17 | 20 | 11 | 15 |
| W 14 x 16 x 665 | 665 | 519260 | 18880 | 24300 | 20,2 | 362,1 | 173380 | 7740 | 11960 | 11,7 | 32,5 | 47490 | 81520 | c | c | nsl | nsl | 18 | 21 | 12 | 16 |
| W 14 x 16 x 605 | 605 | 450550 | 16970 | 21640 | 19,7 | 325,9 | 153360 | 6939 | 10710 | 11,5 | 30,1 | 36880 | 68880 | c | c | nsl | nsl | 19 | 23 | 13 | 17 |
| W 14 x 16 x 550 | 550 | 392540 | 15270 | 19270 | 19,3 | 294,5 | 135540 | 6203 | 9566 | 11,3 | 27,7 | 28210 | 58650 | c | c | nsl | nsl | 21 | 25 | 14 | 18 |
| W 14 x 16 x 500 | 500 | 342470 | 13750 | 17180 | 18,9 | 266,4 | 119940 | 5553 | 8553 | 11,2 | 25,6 | 21660 | 49980 | c | c | nsl | nsl | 23 | 27 | 15 | 20 |
| W 14 x 16 x 455 | 455 | 299820 | 12410 | 15360 | 18,6 | 241,6 | 106880 | 4994 | 7684 | 11,1 | 23,7 | 16680 | 42910 | c | c | nsl | nsl | 24 | 29 | 16 | 21 |
| W 14 x 16 x 426 | 426 | 274520 | 11580 | 14240 | 18,4 | 223,1 | 98260 | 4635 | 7121 | 11,0 | 22,5 | 13960 | 38570 | c | c | nsl | nsl | 26 | 31 | 17 | 22 |
| W 14 x 16 x 398 | 398 | 250510 | 10770 | 13160 | 18,1 | 209,0 | 90180 | 4284 | 6578 | 10,9 | 21,3 | 11520 | 34660 | c | c | nsl | nsl | 27 | 33 | 18 | 23 |
| W 14 x 16 x 370 | 370 | 226460 | 9954 | 12070 | 17,9 | 193,1 | 82500 | 3947 | 6055 | 10,8 | 20,0 | 9395 | 30870 | c | c | nsl | nsl | 29 | 35 | 19 | 25 |
| W 14 x 16 x 342 | 342 | 204880 | 9187 | 11050 | 17,7 | 178,3 | 75410 | 3625 | 5556 | 10,7 | 18,7 | 7513 | 27630 | c | c | nsl | nsl | 31 | 38 | 20 | 27 |
| W 14 x 16 x 311 | 311 | 180510 | 8299 | 9900 | 17,4 | 161,5 | 67040 | 3254 | 4981 | 10,6 | 17,4 | 5746 | 23840 | c | c | nsl | nsl | 34 | 41 | 22 | 29 |
| W 14 x 16 x 283 | 283 | 159930 | 7526 | 8903 | 17,2 | 146,6 | 60080 | 2938 | 4492 | 10,5 | 16,1 | 4416 | 20790 | c | c | nsl | nsl | 37 | 44 | 23 | 31 |
| W 14 x 16 x 257 | 257 | 141670 | 6811 | 7987 | 17,0 | 132,2 | 53620 | 2641 | 4033 | 10,4 | 14,9 | 3348 | 18120 | c | c | nsl | nsl | 40 | 48 | 25 | 34 |
| W 14 x 16 x 233 | 233 | 125300 | 6157 | 7161 | 16,8 | 119,7 | 48090 | 2380 | 3631 | 10,4 | 13,8 | 2532 | 15840 | c | c | nsl | nsl | 44 | 53 | 27 | 37 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

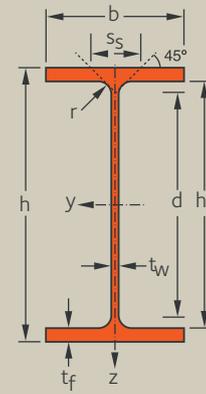
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie dwuteowniki szerokostopowe (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|-----|----------------|----------------|------|----------------|-------|-----------------|---------------------------------------|-------------------|---------------------|---|-------------------|----------|-----------------|---|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50, 65 & 70 | Grade 80 | | |
| W 360 x 410 x 314 | 314 | 399 | 401 | 24,9 | 39,6 | 20 | 320,0 | 280,0 | 400,0 | 2,318 | 7,370 | ✓ | ✓ | ✓ | ✓ | ✓ |
| W 360 x 410 x 287 | 287 | 393 | 399 | 22,6 | 36,6 | 20 | 320,0 | 280,0 | 366,0 | 2,302 | 7,974 | ✓ | ✓ | ✓ | ✓ | ✓ |
| W 360 x 410 x 262 | 262 | 387 | 398 | 21,1 | 33,3 | 20 | 320,0 | 280,0 | 334,0 | 2,289 | 8,676 | ✓ | ✓ | ✓ | ✓ | ✓ |
| W 360 x 410 x 237 | 237 | 380 | 395 | 18,9 | 30,2 | 20 | 320,0 | 280,0 | 301,0 | 2,268 | 9,554 | ✓ | ✓ | ✓ | - | ✓ |
| W 360 x 410 x 216 | 40 216 | 375 | 394 | 17,3 | 27,7 | 20 | 320,0 | 280,0 | 275,0 | 2,257 | 10,38 | ✓ | ✓ | ✓ | - | ✓ |
| W 360 x 370 x 196 | 40 196 | 372 | 374 | 16,4 | 26,2 | 20 | 320,0 | 280,0 | 250,0 | 2,173 | 10,99 | ✓ | ✓ | ✓ | - | ✓ |
| W 360 x 370 x 179 | 40 179 | 368 | 373 | 15,0 | 23,9 | 20 | 320,0 | 280,0 | 228,0 | 2,164 | 12,00 | ✓ | ✓ | ✓ | - | ✓ |
| W 360 x 370 x 162 | 40 162 | 364 | 371 | 13,3 | 21,8 | 20 | 320,0 | 280,0 | 206,0 | 2,151 | 13,19 | ✓ | ✓ | ✓ | - | ✓ |
| W 360 x 370 x 147 | 40 147 | 360 | 370 | 12,3 | 19,8 | 20 | 320,0 | 280,0 | 188,0 | 2,141 | 14,40 | ✓ | ✓ | ✓ | - | ✓ |
| W 360 x 370 x 134 | 134 | 356 | 369 | 11,2 | 18,0 | 20 | 320,0 | 280,0 | 171,0 | 2,131 | 15,77 | ✓ | ✓ | ✓ | - | ✓ |
| W 360 x 250 x 122 | 122 | 363 | 257 | 13,0 | 21,7 | 15 | 320,0 | 290,0 | 155,0 | 1,702 | 13,99 | ✓ | ✓ | - | - | ✓ |
| W 360 x 250 x 110 | 110 | 360 | 256 | 11,4 | 19,9 | 15 | 320,0 | 290,0 | 141,0 | 1,695 | 15,39 | ✓ | ✓ | - | - | ✓ |
| W 360 x 250 x 101 | 101 | 357 | 255 | 10,5 | 18,3 | 15 | 320,0 | 290,0 | 129,0 | 1,687 | 16,67 | ✓ | ✓ | - | - | ✓ |
| W 360 x 250 x 91 | 91 | 353 | 254 | 9,5 | 16,4 | 15 | 320,0 | 290,0 | 115,0 | 1,677 | 18,47 | ✓ | ✓ | - | - | ✓ |
| W 360 x 200 x 79 | 79 | 354 | 205 | 9,4 | 16,8 | 15 | 320,0 | 290,0 | 101,0 | 1,483 | 18,72 | ✓ | ✓ | - | - | ✓ |
| W 360 x 200 x 72 | 72 | 350 | 204 | 8,6 | 15,1 | 15 | 320,0 | 290,0 | 91,0 | 1,473 | 20,61 | ✓ | ✓ | - | - | ✓ |
| W 360 x 200 x 64 | 64 | 347 | 203 | 7,7 | 13,5 | 15 | 320,0 | 290,0 | 81,3 | 1,465 | 22,93 | ✓ | ✓ | - | - | ✓ |
| W 360 x 170 x 58 | 58 | 358 | 172 | 7,9 | 13,1 | 10 | 332,0 | 312,0 | 72,3 | 1,371 | 24,21 | ✓ | ✓ | - | - | ✓ |
| W 360 x 170 x 51 | 51 | 355 | 171 | 7,2 | 11,6 | 10 | 332,0 | 312,0 | 64,5 | 1,362 | 26,93 | ✓ | ✓ | - | - | ✓ |
| W 360 x 170 x 44.6 | 44,6 | 352 | 171 | 6,9 | 9,8 | 10 | 332,0 | 312,0 | 57,1 | 1,357 | 30,16 | ✓ | ✓ | - | - | ✓ |
| W 360 x 130 x 39.0 | 39 | 353 | 128 | 6,5 | 10,7 | 10 | 332,0 | 312,0 | 49,6 | 1,188 | 30,39 | ✓ | ✓ | - | - | ✓ |
| W 360 x 130 x 32.9 | 32,9 | 349 | 127 | 5,8 | 8,5 | 10 | 332,0 | 312,0 | 41,9 | 1,177 | 35,95 | ✓ | ✓ | - | - | ✓ |
| W 310 x 310 x 342 | 40 342 | 382 | 328 | 32,6 | 52,6 | 20 | 277,1 | 237,1 | 437,0 | 1,976 | 5,738 | ✓ | ✓ | ✓ | ✓ | - |
| W 310 x 310 x 313 | 40 313 | 374 | 325 | 30,0 | 48,3 | 20 | 277,1 | 237,1 | 399,0 | 1,954 | 6,214 | ✓ | ✓ | ✓ | ✓ | ✓ |
| W 310 x 310 x 283 | 40 283 | 365 | 322 | 26,9 | 44,1 | 20 | 277,1 | 237,1 | 360,0 | 1,930 | 6,794 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 253 | 40 253 | 356 | 319 | 24,4 | 39,6 | 20 | 277,1 | 237,1 | 323,0 | 1,905 | 7,499 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 226 | 40 226 | 348 | 317 | 22,1 | 35,6 | 20 | 277,1 | 237,1 | 288,0 | 1,885 | 8,271 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 202 | 40 202 | 341 | 315 | 20,1 | 31,8 | 20 | 277,1 | 237,1 | 257,0 | 1,867 | 9,164 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 179 | 40 179 | 333 | 313 | 18,0 | 28,1 | 20 | 277,1 | 237,1 | 228,0 | 1,848 | 10,27 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 158 | 158 | 327 | 310 | 15,5 | 25,1 | 20 | 277,1 | 237,1 | 201,0 | 1,829 | 11,54 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 143 | 143 | 323 | 309 | 14,0 | 22,9 | 20 | 277,1 | 237,1 | 182,0 | 1,820 | 12,62 | ✓ | ✓ | ✓ | - | ✓ |

40 Minimum order: 40t per section and grade or upon agreement.

40 Pedido mínimo: 40t por sección y grado o previo acuerdo.

40 Minimalne zamówienie: 40t na sekcję i gatunek po uzgodnieniu.



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odknošniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V (m-1) | | | | |
|---|---|-----------------|-----------------|-----------|-----------------|-----------------|---|-----------------|-----------|-------|-----------------|-----------------|-------------------------------------|----------|-------------|----------|--|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | G | I_y | W_{ely} | W_{ply} | i_y | A_{Vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| W 14 x 16 x 211 | 211 | 110580 | 5543 | 6397 | 16,6 | 108,7 | 42600 | 2125 | 3239 | 10,3 | 12,7 | 1891 | 13740 | c | c | nsl | nsl | 48 | 58 | 30 | 40 |
| W 14 x 16 x 193 | 193 | 100060 | 5092 | 5835 | 16,4 | 98,62 | 38780 | 1944 | 2959 | 10,2 | 11,9 | 1484 | 12300 | c | c | nsl | nsl | 52 | 63 | 32 | 43 |
| W 14 x 16 x 176 | 176 | 89760 | 4638 | 5282 | 16,3 | 91,38 | 35020 | 1759 | 2678 | 10,2 | 11,1 | 1133 | 10940 | c | c | nsl | nsl | 56 | 68 | 35 | 47 |
| W 14 x 16 x 159 | 159 | 79130 | 4164 | 4708 | 16,1 | 81,62 | 31040 | 1571 | 2389 | 10,1 | 10,2 | 841,9 | 9489 | c | c | nsl | nsl | 62 | 75 | 38 | 51 |
| W 14 x 16 x 145 | 145 | 71490 | 3813 | 4285 | 16,0 | 74,59 | 28250 | 1434 | 2178 | 10,0 | 9,6 | 652,1 | 8514 | c | c | nsl | nsl | 67 | 81 | 41 | 56 |
| W 14 x 14.5 x 132 | 132 | 63980 | 3440 | 3860 | 15,9 | 70,62 | 22860 | 1222 | 1858 | 9,5 | 9,2 | 530,9 | 6828 | c | c | nsl | nsl | 71 | 86 | 44 | 59 |
| W 14 x 14.5 x 120 | 120 | 57790 | 3141 | 3505 | 15,8 | 64,6 | 20680 | 1109 | 1684 | 9,4 | 8,6 | 406,0 | 6119 | c | nc | nsl | nsl | 78 | 94 | 48 | 65 |
| W 14 x 14.5 x 109 | 109 | 51890 | 2851 | 3162 | 15,8 | 57,66 | 18560 | 1000 | 1518 | 9,4 | 8,0 | 306,6 | 5431 | nc | nc | nsl | nsl | 86 | 104 | 53 | 71 |
| W 14 x 14.5 x 99 | 99 | 46640 | 2591 | 2861 | 15,6 | 53,19 | 16720 | 904 | 1371 | 9,3 | 7,5 | 233,3 | 4836 | nc | nc | nsl | nsl | 94 | 113 | 58 | 77 |
| W 14 x 14.5 x 90 | 90 | 41860 | 2352 | 2585 | 15,5 | 48,48 | 15080 | 817,3 | 1238 | 9,3 | 7,0 | 177,3 | 4305 | nc | nc | nsl | nsl | 102 | 124 | 63 | 84 |
| W 14 x 10 x 82 | 82 | 36530 | 2012 | 2265 | 15,3 | 52,81 | 6147 | 478,3 | 732,0 | 6,2 | 7,3 | 210,6 | 1787 | c | c | nsl | nsl | 93 | 110 | 63 | 80 |
| W 14 x 10 x 74 | 74 | 33090 | 1838 | 2055 | 15,3 | 46,67 | 5570 | 435,1 | 664,2 | 6,3 | 6,8 | 160,2 | 1609 | c | c | nsl | nsl | 103 | 121 | 70 | 88 |
| W 14 x 10 x 68 | 68 | 30140 | 1688 | 1880 | 15,2 | 42,98 | 5061 | 397,0 | 605,4 | 6,2 | 6,4 | 125,3 | 1450 | c | c | nsl | nsl | 111 | 131 | 75 | 95 |
| W 14 x 10 x 61 | 61 | 26690 | 1512 | 1675 | 15,1 | 38,82 | 4482 | 352,9 | 537,8 | 6,2 | 5,9 | 91,36 | 1268 | c | nc | nsl | nsl | 123 | 145 | 83 | 105 |
| W 14 x 8 x 53 | 53 | 22640 | 1279 | 1432 | 14,9 | 38,66 | 2415 | 235,6 | 361,6 | 4,8 | 6,0 | 81,14 | 685,7 | c | c | nsl | nsl | 127 | 147 | 90 | 111 |
| W 14 x 8 x 48 | 48 | 20100 | 1148 | 1281 | 14,8 | 35,26 | 2139 | 209,7 | 321,5 | 4,8 | 5,6 | 60,09 | 599,0 | c | c | nsl | nsl | 139 | 162 | 99 | 122 |
| W 14 x 8 x 43 | 43 | 17820 | 1027 | 1141 | 14,7 | 31,66 | 1884 | 185,6 | 284,2 | 4,8 | 5,2 | 43,64 | 523,3 | c | c | nsl | nsl | 155 | 180 | 110 | 135 |
| W 14 x 6.75 x 38 | 38 | 16040 | 896,2 | 1008 | 14,9 | 30,72 | 1112 | 129,3 | 199,4 | 3,9 | 4,5 | 33,32 | 330,3 | c | c | nsl | nsl | 166 | 190 | 123 | 147 |
| W 14 x 6.75 x 34 | 34 | 14120 | 795,5 | 893,3 | 14,8 | 27,90 | 968,0 | 113,2 | 174,3 | 3,8 | 4,2 | 23,71 | 284,9 | c | c | nsl | nsl | 185 | 211 | 137 | 163 |
| W 14 x 6.75 x 30 | 30 | 12150 | 690,7 | 778,1 | 14,5 | 26,43 | 817,9 | 95,66 | 147,7 | 3,7 | 3,8 | 15,92 | 239,0 | nc | nc | sl | sl | 207 | 237 | 153 | 183 |
| W 14 x 5 x 26 | 26 | 10230 | 579,6 | 661,5 | 14,3 | 25,24 | 375,0 | 58,59 | 91,62 | 2,7 | 3,9 | 15,01 | 109,5 | c | c | nsl | nsl | 213 | 238 | 167 | 193 |
| W 14 x 5 x 22 | 22 | 8258 | 473,2 | 541,4 | 14,0 | 22,30 | 290,9 | 45,82 | 71,78 | 2,6 | 3,4 | 8,531 | 84,11 | c | c | sl | sl | 252 | 282 | 198 | 228 |
| W 12 x 12 x 230 | 230 | 100770 | 5276 | 6353 | 15,1 | 131,8 | 31030 | 1892 | 2910 | 8,4 | 16,1 | 3570 | 8391 | c | c | nsl | nsl | 38 | 45 | 25 | 32 |
| W 12 x 12 x 210 | 210 | 89820 | 4803 | 5735 | 14,9 | 120,4 | 27710 | 1705 | 2619 | 8,3 | 15 | 2763 | 7328 | c | c | nsl | nsl | 41 | 49 | 27 | 35 |
| W 12 x 12 x 190 | 190 | 78940 | 4325 | 5118 | 14,7 | 107,3 | 24590 | 1527 | 2342 | 8,2 | 13,8 | 2085 | 6317 | c | c | nsl | nsl | 44 | 53 | 29 | 38 |
| W 12 x 12 x 170 | 170 | 68480 | 3847 | 4510 | 14,5 | 96,47 | 21460 | 1345 | 2061 | 8,1 | 12,7 | 1516 | 5362 | c | c | nsl | nsl | 49 | 59 | 32 | 42 |
| W 12 x 12 x 152 | 152 | 59820 | 3438 | 3994 | 14,3 | 86,71 | 18930 | 1194 | 1827 | 8,0 | 11,6 | 1108 | 4611 | c | c | nsl | nsl | 54 | 65 | 35 | 46 |
| W 12 x 12 x 136 | 136 | 52240 | 3064 | 3530 | 14,1 | 78,30 | 16590 | 1053 | 1610 | 7,9 | 10,7 | 799,8 | 3959 | c | c | nsl | nsl | 60 | 72 | 38 | 51 |
| W 12 x 12 x 120 | 120 | 44790 | 2690 | 3072 | 13,9 | 69,55 | 14380 | 918,9 | 1403 | 7,9 | 9,7 | 558,3 | 3337 | c | c | nsl | nsl | 67 | 81 | 43 | 56 |
| W 12 x 12 x 106 | 106 | 38890 | 2379 | 2691 | 13,8 | 60,26 | 12470 | 804,9 | 1226 | 7,8 | 8,9 | 393,5 | 2839 | c | c | nsl | nsl | 75 | 91 | 48 | 63 |
| W 12 x 12 x 96 | 96 | 35020 | 2168 | 2438 | 13,8 | 54,60 | 11270 | 729,5 | 1110 | 7,8 | 8,3 | 300,1 | 2535 | c | c | nsl | nsl | 82 | 99 | 52 | 69 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

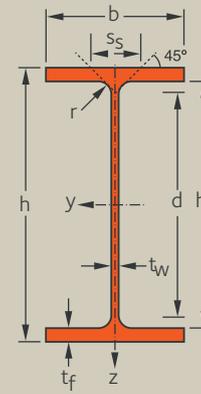
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie dwuteowniki szerokostopowe (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|-----|----------------|----------------|------|----------------|-------|-----------------|---------------------------------------|-------------------|---------------------|---|-------------------|----------|-----------------|---|
| | h | b | t _w | t _f | r | h ₁ | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50, 65 & 70 | Grade 80 | | |
| W 310 x 310 x 129 | 129 | 318 | 308 | 13,1 | 20,6 | 20 | 277,1 | 237,1 | 165,0 | 1,807 | 13,82 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 117 | 117 | 314 | 307 | 11,9 | 18,7 | 20 | 277,1 | 237,1 | 150,0 | 1,798 | 15,15 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 107 | 107 | 311 | 306 | 10,9 | 17,0 | 20 | 277,1 | 237,1 | 136,0 | 1,790 | 16,56 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 310 x 97 | 97 | 308 | 305 | 9,9 | 15,4 | 20 | 277,1 | 237,1 | 123,0 | 1,782 | 18,19 | ✓ | ✓ | ✓ | - | ✓ |
| W 310 x 250 x 86 | 86 | 310 | 254 | 9,1 | 16,3 | 15 | 277,1 | 247,1 | 110,0 | 1,592 | 18,44 | ✓ | ✓ | - | - | ✓ |
| W 310 x 250 x 79 | 79 | 306 | 254 | 8,8 | 14,6 | 15 | 277,1 | 247,1 | 101,0 | 1,585 | 20,10 | ✓ | ✓ | - | - | ✓ |
| W 310 x 200 x 74 | 74 | 310 | 205 | 9,4 | 16,3 | 15 | 277,1 | 247,1 | 94,8 | 1,395 | 18,74 | ✓ | ✓ | - | - | ✓ |
| W 310 x 200 x 67 | 67 | 306 | 204 | 8,5 | 14,6 | 15 | 277,1 | 247,1 | 85,2 | 1,385 | 20,75 | ✓ | ✓ | - | - | ✓ |
| W 310 x 200 x 60 | 60 | 303 | 203 | 7,5 | 13,1 | 15 | 277,1 | 247,1 | 76,1 | 1,377 | 23,12 | ✓ | ✓ | - | - | ✓ |
| W 310 x 165 x 52 | 52 | 317 | 167 | 7,6 | 13,2 | 8 | 291,1 | 275,1 | 66,5 | 1,273 | 24,30 | ✓ | ✓ | - | - | ✓ |
| W 310 x 165 x 44,5 | 44,5 | 313 | 166 | 6,6 | 11,2 | 8 | 291,1 | 275,1 | 56,7 | 1,263 | 28,27 | ✓ | ✓ | - | - | ✓ |
| W 310 x 165 x 38,7 | 38,7 | 310 | 165 | 5,8 | 9,7 | 8 | 291,1 | 275,1 | 49,4 | 1,255 | 32,35 | ✓ | ✓ | - | - | ✓ |
| W 310 x 100 x 32,7 | 32,7 | 313 | 102 | 6,6 | 10,8 | 8 | 291,1 | 275,1 | 41,8 | 1,007 | 30,68 | ✓ | ✓ | - | - | ✓ |
| W 310 x 100 x 28,3 | 28,3 | 309 | 102 | 6,0 | 8,9 | 8 | 291,1 | 275,1 | 35,9 | 1,000 | 35,21 | ✓ | ✓ | - | - | ✓ |
| W 310 x 100 x 23,8 | 23,8 | 305 | 101 | 5,6 | 6,7 | 8 | 291,1 | 275,1 | 30,4 | 0,989 | 41,43 | ✓ | ✓ | - | - | ✓ |
| W 310 x 100 x 21,0 | 21 | 303 | 101 | 5,1 | 5,7 | 8 | 291,1 | 275,1 | 26,8 | 0,986 | 46,63 | ✓ | ✓ | - | - | ✓ |
| W 250 x 250 x 149 | 149 | 282 | 263 | 17,3 | 28,4 | 13 | 225,0 | 199,0 | 190,0 | 1,559 | 10,46 | ✓ | ✓ | ✓ | - | ✓ |
| W 250 x 250 x 131 | 131 | 275 | 261 | 15,4 | 25,1 | 13 | 225,0 | 199,0 | 167,0 | 1,541 | 11,75 | ✓ | ✓ | ✓ | - | ✓ |
| W 250 x 250 x 115 | 115 | 269 | 259 | 13,5 | 22,1 | 13 | 225,0 | 199,0 | 146,0 | 1,525 | 13,28 | ✓ | ✓ | ✓ | - | ✓ |
| W 250 x 250 x 101 | 101 | 264 | 257 | 11,9 | 19,6 | 13 | 225,0 | 199,0 | 129,0 | 1,510 | 14,92 | ✓ | ✓ | ✓ | - | ✓ |
| W 250 x 250 x 89 | 89 | 260 | 256 | 10,7 | 17,3 | 13 | 225,0 | 199,0 | 114,0 | 1,500 | 16,74 | ✓ | ✓ | ✓ | - | ✓ |
| W 250 x 250 x 80 | 80 | 256 | 255 | 9,4 | 15,6 | 13 | 225,0 | 199,0 | 102,0 | 1,491 | 18,60 | ✓ | ✓ | ✓ | - | ✓ |
| W 250 x 250 x 73 | 73 | 253 | 254 | 8,6 | 14,2 | 13 | 225,0 | 199,0 | 92,9 | 1,482 | 20,32 | ✓ | ✓ | ✓ | - | ✓ |
| W 250 x 200 x 67 | 67 | 257 | 204 | 8,9 | 15,7 | 13 | 225,0 | 199,0 | 85,8 | 1,290 | 19,20 | ✓ | ✓ | - | - | ✓ |
| W 250 x 200 x 58 | 58 | 252 | 203 | 8,0 | 13,5 | 13 | 225,0 | 199,0 | 74,2 | 1,278 | 21,92 | ✓ | ✓ | - | - | ✓ |
| W 250 x 200 x 49.1 | 49,1 | 247 | 202 | 7,4 | 11,0 | 13 | 225,0 | 199,0 | 62,6 | 1,265 | 25,77 | ✓ | ✓ | - | - | ✓ |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do simbolov na straneh 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | | |
|---|---|-----------------|-----------------|-----------|-----------------|-----------------|---|-----------------|-----------|-------|-----------------|-----------------|-------------------------------------|----------|-------------|----------|--|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | G | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| W 12 x 12 x 87 | 87 | 31030 | 1951 | 2183 | 13,6 | 50,63 | 10040 | 652,0 | 992,7 | 7,7 | 7,7 | 224,4 | 2218 | c | c | nsl | nsl | 90 | 108 | 57 | 75 |
| W 12 x 12 x 79 | 79 | 27770 | 1769 | 1968 | 13,5 | 46,05 | 9025 | 588,0 | 894,5 | 7,7 | 7,2 | 169,9 | 1965 | nc | nc | nsl | nsl | 99 | 119 | 62 | 82 |
| W 12 x 12 x 72 | 72 | 25050 | 1611 | 1784 | 13,4 | 42,27 | 8125 | 531,0 | 807,5 | 7,6 | 6,8 | 129,8 | 1754 | nc | nc | nsl | nsl | 108 | 130 | 67 | 90 |
| W 12 x 12 x 65 | 65 | 22500 | 1461 | 1610 | 13,4 | 38,56 | 7288 | 477,9 | 726,3 | 7,6 | 6,4 | 98,33 | 1558 | nc | nc | nsl | nsl | 118 | 143 | 74 | 98 |
| W 12 x 10 x 58 | 58 | 19840 | 1280 | 1417 | 13,4 | 33,54 | 4454 | 350,7 | 533,0 | 6,3 | 5,9 | 87,42 | 960,0 | c | nc | nsl | nsl | 122 | 145 | 79 | 103 |
| W 12 x 10 x 53 | 53 | 17660 | 1154 | 1275 | 13,2 | 31,95 | 3990 | 314,2 | 477,8 | 6,3 | 5,5 | 65,53 | 846,4 | nc | nc | nsl | nsl | 132 | 158 | 86 | 111 |
| W 12 x 8 x 50 | 50 | 16450 | 1061 | 1188 | 13,1 | 34,42 | 2343 | 228,6 | 350,1 | 4,9 | 5,9 | 74,27 | 504,7 | c | c | nsl | nsl | 126 | 147 | 87 | 109 |
| W 12 x 8 x 45 | 45 | 14510 | 948,4 | 1056 | 13,0 | 31,08 | 2068 | 202,7 | 310,2 | 4,9 | 5,5 | 54,30 | 438,5 | c | c | nsl | nsl | 139 | 163 | 96 | 120 |
| W 12 x 8 x 40 | 40 | 12860 | 848,8 | 940,6 | 13,0 | 27,6 | 1828 | 180,1 | 275,1 | 4,9 | 5,1 | 39,56 | 383,7 | c | nc | nsl | nsl | 155 | 182 | 107 | 133 |
| W 12 x 6.5 x 35 | 35 | 11840 | 747,4 | 838,0 | 13,3 | 25,75 | 1025 | 122,8 | 188,5 | 3,9 | 4,3 | 30,93 | 236,4 | c | c | nsl | nsl | 166 | 191 | 120 | 145 |
| W 12 x 6.5 x 30 | 30 | 9933 | 634,7 | 708,3 | 13,2 | 22,26 | 854,7 | 102,9 | 157,7 | 3,8 | 3,8 | 19,24 | 194,4 | c | c | nsl | nsl | 193 | 222 | 139 | 168 |
| W 12 x 6.5 x 26 | 26 | 8518 | 549,5 | 610,9 | 13,1 | 19,51 | 726,8 | 88,1 | 134,7 | 3,8 | 3,4 | 12,67 | 163,7 | nc | nc | nsl | nsl | 221 | 254 | 159 | 192 |
| W 12 x 4 x 22 | 22 | 6507 | 415,7 | 480,9 | 12,4 | 22,22 | 191,8 | 37,62 | 59,63 | 2,1 | 3,7 | 12,27 | 43,61 | c | c | nsl | nsl | 216 | 241 | 174 | 198 |
| W 12 x 4 x 19 | 19 | 5437 | 351,9 | 407,5 | 12,2 | 19,97 | 158,0 | 30,99 | 49,18 | 2,0 | 3,3 | 7,652 | 35,44 | c | c | nsl | sl | 248 | 276 | 199 | 227 |
| W 12 x 4 x 16 | 16 | 4282 | 280,8 | 328,8 | 11,8 | 18,32 | 115,6 | 22,89 | 36,71 | 1,9 | 2,8 | 4,303 | 25,59 | c | c | sl | sl | 292 | 325 | 234 | 267 |
| W 12 x 4 x 14 | 14 | 3712 | 245,0 | 287,4 | 11,7 | 16,62 | 98,31 | 19,46 | 31,2 | 1,9 | 2,5 | 2,983 | 21,62 | nc | nc | sl | sl | 329 | 366 | 262 | 300 |
| W 10 x 10 x 100 | 100 | 25930 | 1839 | 2129 | 11,6 | 52,70 | 8622 | 655,6 | 1000 | 6,7 | 8,9 | 451,9 | 1384 | c | c | nsl | nsl | 68 | 82 | 44 | 57 |
| W 10 x 10 x 88 | 88 | 22150 | 1611 | 1847 | 11,5 | 46,46 | 7446 | 570,6 | 869,7 | 6,6 | 8,0 | 313,1 | 1161 | c | c | nsl | nsl | 77 | 92 | 49 | 64 |
| W 10 x 10 x 77 | 77 | 18940 | 1408 | 1599 | 11,3 | 40,52 | 6405 | 494,6 | 752,8 | 6,6 | 7,2 | 213,8 | 975,2 | c | c | nsl | nsl | 87 | 104 | 54 | 72 |
| W 10 x 10 x 68 | 68 | 16370 | 1240 | 1397 | 11,2 | 35,63 | 5549 | 431,8 | 656,5 | 6,5 | 6,6 | 149,1 | 828,0 | c | c | nsl | nsl | 97 | 117 | 61 | 81 |
| W 10 x 10 x 60 | 60 | 14260 | 1097 | 1226 | 11,1 | 31,91 | 4840 | 378,1 | 574,5 | 6,5 | 6,0 | 103,9 | 712,3 | c | c | nsl | nsl | 109 | 131 | 68 | 90 |
| W 10 x 10 x 54 | 54 | 12570 | 982,4 | 1090 | 11,0 | 28,10 | 4313 | 338,3 | 513,2 | 6,4 | 5,5 | 75,94 | 622,8 | nc | nc | nsl | nsl | 121 | 146 | 75 | 100 |
| W 10 x 10 x 49 | 49 | 11280 | 891,8 | 985,6 | 11,0 | 25,67 | 3880 | 305,5 | 463,2 | 6,4 | 5,2 | 57,72 | 552,9 | nc | nc | nsl | nsl | 132 | 160 | 82 | 109 |
| W 10 x 8 x 45 | 45 | 10360 | 806,5 | 902,0 | 11,0 | 27,00 | 2223 | 218,0 | 332,2 | 5,0 | 5,5 | 62,72 | 323,3 | c | c | nsl | nsl | 127 | 151 | 84 | 108 |
| W 10 x 8 x 39 | 39 | 8736 | 693,3 | 770,7 | 10,8 | 24,04 | 1883 | 185,6 | 282,7 | 5,0 | 5,0 | 41,15 | 267,6 | c | c | nsl | nsl | 145 | 172 | 95 | 123 |
| W 10 x 8 x 33 | 33 | 7069 | 572,3 | 633,9 | 10,6 | 21,77 | 1512 | 149,7 | 228,4 | 4,9 | 4,4 | 24,24 | 210,4 | nc | nc | nsl | nsl | 170 | 202 | 111 | 144 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange sections (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas paralelas (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

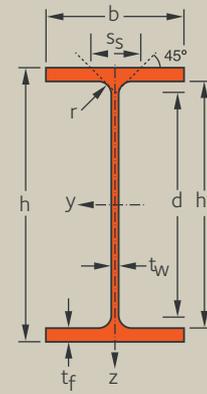
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie dwuteowniki szerokostopowe (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|-----|----------------|----------------|------|----------------|-------|-----------------|---------------------------------------|-------------------|---------------------|---|-------------------|----------|-----------------|---|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50, 65 & 70 | Grade 80 | | |
| W 250 x 145 x 44.8 | 44,8 | 266 | 148 | 7,6 | 13,0 | 8 | 240,0 | 224,0 | 57,0 | 1,095 | 24,36 | ✓ | ✓ | - | - | ✓ |
| W 250 x 145 x 38.5 | 38,5 | 262 | 147 | 6,6 | 11,2 | 8 | 240,0 | 224,0 | 49,1 | 1,085 | 28,04 | ✓ | ✓ | - | - | ✓ |
| W 250 x 145 x 32.7 | 32,7 | 258 | 146 | 6,1 | 9,1 | 8 | 240,0 | 224,0 | 41,9 | 1,074 | 32,77 | ✓ | ✓ | - | - | ✓ |
| W 250 x 100 x 28.4 | 28,4 | 260 | 102 | 6,4 | 10,0 | 8 | 240,0 | 224,0 | 36,3 | 0,901 | 31,61 | ✓ | ✓ | - | - | ✓ |
| W 250 x 100 x 25.3 | 25,3 | 257 | 102 | 6,1 | 8,4 | 8 | 240,0 | 224,0 | 32,2 | 0,896 | 35,30 | ✓ | ✓ | - | - | ✓ |
| W 250 x 100 x 22.3 | 22,3 | 254 | 102 | 5,8 | 6,9 | 8 | 240,0 | 224,0 | 28,5 | 0,891 | 39,75 | ✓ | ✓ | - | - | ✓ |
| W 250 x 100 x 17.9 | 17,9 | 251 | 101 | 4,8 | 5,3 | 8 | 240,0 | 224,0 | 22,8 | 0,883 | 49,35 | ✓ | ✓ | - | - | ✓ |
| W 200 x 200 x 100 | 100 | 229 | 210 | 14,5 | 23,7 | 10 | 181,1 | 161,1 | 127,0 | 1,252 | 12,59 | ✓ | ✓ | - | - | ✓ |
| W 200 x 200 x 86 | 86 | 222 | 209 | 13,0 | 20,6 | 10 | 181,1 | 161,1 | 110,0 | 1,237 | 14,26 | ✓ | ✓ | - | - | ✓ |
| W 200 x 200 x 71 | 71 | 216 | 206 | 10,2 | 17,4 | 10 | 181,1 | 161,1 | 91,0 | 1,218 | 17,05 | ✓ | ✓ | - | - | ✓ |
| W 200 x 200 x 59 | 59 | 210 | 205 | 9,1 | 14,2 | 10 | 181,1 | 161,1 | 75,0 | 1,205 | 20,30 | ✓ | ✓ | - | - | ✓ |
| W 200 x 200 x 52 | 52 | 206 | 204 | 7,9 | 12,6 | 10 | 181,1 | 161,1 | 66,5 | 1,195 | 22,87 | ✓ | ✓ | - | - | ✓ |
| W 200 x 200 x 46.1 | 46,1 | 203 | 203 | 7,2 | 11,0 | 10 | 181,1 | 161,1 | 58,9 | 1,186 | 25,80 | ✓ | ✓ | - | - | ✓ |
| W 200 x 165 x 41.7 | 41,7 | 205 | 166 | 7,2 | 11,8 | 10 | 181,1 | 161,1 | 53,2 | 1,042 | 25,00 | ✓ | ✓ | - | - | ✓ |
| W 200 x 165 x 35.9 | 35,9 | 201 | 165 | 6,2 | 10,2 | 10 | 181,1 | 161,1 | 45,7 | 1,032 | 28,76 | ✓ | ✓ | - | - | ✓ |
| W 200 x 135 x 31.3 | 31,3 | 210 | 134 | 6,4 | 10,2 | 8 | 190,0 | 174,0 | 39,7 | 0,929 | 29,57 | ✓ | ✓ | - | - | ✓ |
| W 200 x 135 x 26.6 | 26,6 | 207 | 133 | 5,8 | 8,4 | 8 | 190,0 | 174,0 | 33,9 | 0,921 | 34,58 | ✓ | ✓ | - | - | ✓ |
| W 200 x 100 x 22.5 | 22,5 | 206 | 102 | 6,2 | 8,0 | 8 | 190,0 | 174,0 | 28,6 | 0,794 | 35,30 | ✓ | ✓ | - | - | ✓ |
| W 200 x 100 x 19.3 | 19,3 | 203 | 102 | 5,8 | 6,5 | 8 | 190,0 | 174,0 | 24,8 | 0,789 | 40,48 | ✓ | ✓ | - | - | ✓ |
| W 200 x 100 x 15.0 | 15 | 200 | 100 | 4,3 | 5,2 | 8 | 190,0 | 174,0 | 19,1 | 0,778 | 51,88 | ✓ | ✓ | - | - | ✓ |
| W 150 x 150 x 37.1 | 37,1 | 162 | 154 | 8,1 | 11,6 | 6 | 138,9 | 126,9 | 47,4 | 0,913 | 24,60 | ✓ | ✓ | - | - | ✓ |
| W 150 x 150 x 29.8 | 29,8 | 157 | 153 | 6,6 | 9,3 | 6 | 138,9 | 126,9 | 37,9 | 0,902 | 30,32 | ✓ | ✓ | - | - | ✓ |
| W 150 x 150 x 22.5 | 22,5 | 152 | 152 | 5,8 | 6,6 | 6 | 138,9 | 126,9 | 28,6 | 0,890 | 39,89 | ✓ | ✓ | - | - | ✓ |
| W 150 x 100 x 24.0 | ☎ 24 | 160 | 102 | 6,6 | 10,3 | 6 | 138,9 | 126,9 | 30,6 | 0,704 | 29,38 | ✓ | ✓ | - | - | - |
| W 150 x 100 x 18.0 | ☎ 18 | 153 | 102 | 5,8 | 7,1 | 6 | 138,9 | 126,9 | 22,9 | 0,692 | 38,59 | ✓ | ✓ | - | - | - |
| W 150 x 100 x 13.5 | ☎ 13,5 | 150 | 100 | 4,3 | 5,5 | 6 | 138,9 | 126,9 | 17,3 | 0,681 | 50,19 | ✓ | ✓ | - | - | - |
| W 130 x 130 x 28.1 | ☎ 28,1 | 131 | 128 | 6,9 | 10,9 | 8 | 109,0 | 93,0 | 35,9 | 0,746 | 26,41 | ✓ | ✓ | - | - | - |
| W 130 x 130 x 23.8 | ☎ 23,8 | 127 | 127 | 6,1 | 9,1 | 8 | 109,0 | 93,0 | 30,3 | 0,736 | 30,94 | ✓ | ✓ | - | - | - |
| W 100 x 100 x 19.3 | ☎ 19,3 | 106 | 103 | 7,1 | 8,8 | 6 | 88,1 | 76,1 | 24,7 | 0,599 | 30,88 | ✓ | ✓ | - | - | - |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnośniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | | | | |
|---|---|-----------------|------------------|------------------|-----------------|-----------------|---|------------------|------------------|----------------|-----------------|-----------------|-------------------------------------|----------|---|----------|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | G | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | | |
| W 10 x 5.75 x 30 | 30 | 7115 | 534,9 | 602,7 | 11,1 | 21,85 | 703,4 | 95,06 | 146,1 | 3,5 | 4,2 | 26,28 | 112,3 | c | c | nsl | nsl | 165 | 191 | 119 | 145 |
| W 10 x 5.75 x 26 | 26 | 6014 | 459,1 | 514,1 | 11,0 | 18,89 | 593,6 | 80,77 | 123,8 | 3,4 | 3,8 | 16,97 | 93,24 | c | c | nsl | nsl | 190 | 220 | 136 | 166 |
| W 10 x 5.75 x 22 | 22 | 4894 | 379,4 | 424,8 | 10,8 | 17,18 | 472,6 | 64,73 | 99,48 | 3,3 | 3,3 | 9,935 | 73,10 | nc | nc | nsl | nsl | 222 | 257 | 159 | 194 |
| W 10 x 4 x 19 | 19 | 4003 | 307,9 | 353,6 | 10,5 | 18,14 | 177,5 | 34,81 | 54,75 | 2,2 | 3,5 | 9,766 | 27,63 | c | c | nsl | nsl | 220 | 248 | 171 | 199 |
| W 10 x 4 x 17 | 17 | 3429 | 266,9 | 307,4 | 10,2 | 17,05 | 149,1 | 29,24 | 46,19 | 2,1 | 3,2 | 6,600 | 22,95 | c | c | nsl | nsl | 246 | 277 | 190 | 222 |
| W 10 x 4 x 15 | 15 | 2895 | 228,0 | 264,0 | 10,0 | 15,98 | 122,5 | 24,03 | 38,17 | 2,0 | 2,8 | 4,404 | 18,62 | c | c | sl | sl | 276 | 312 | 214 | 249 |
| W 10 x 4 x 12 | 12 | 2248 | 179,1 | 207,3 | 9,9 | 13,19 | 91,34 | 18,08 | 28,64 | 2,0 | 2,4 | 2,283 | 13,73 | nc | nc | sl | sl | 343 | 387 | 265 | 309 |
| W 8 x 8 x 67 | 67 | 11320 | 989,1 | 1148 | 9,4 | 35,36 | 3663 | 348,9 | 532,9 | 5,3 | 7,3 | 208,9 | 385,4 | c | c | nsl | nsl | 82 | 99 | 53 | 69 |
| W 8 x 8 x 58 | 58 | 9469 | 853,0 | 980,9 | 9,2 | 31,16 | 3138 | 300,3 | 458,3 | 5,3 | 6,5 | 139,4 | 317,8 | c | c | nsl | nsl | 93 | 112 | 59 | 78 |
| W 8 x 8 x 48 | 48 | 7659 | 709,2 | 803,1 | 9,1 | 24,59 | 2537 | 246,3 | 374,5 | 5,2 | 5,6 | 81,67 | 249,9 | c | c | nsl | nsl | 111 | 134 | 70 | 93 |
| W 8 x 8 x 40 | 40 | 6111 | 582,0 | 652,6 | 8,9 | 21,51 | 2040 | 199,0 | 302,7 | 5,1 | 4,9 | 46,33 | 195,4 | c | c | nsl | nsl | 132 | 159 | 83 | 110 |
| W 8 x 8 x 35 | 35 | 5269 | 511,6 | 569,2 | 8,8 | 18,65 | 1783 | 174,8 | 265,5 | 5,1 | 4,4 | 32,26 | 166,7 | nc | nc | nsl | nsl | 149 | 180 | 93 | 123 |
| W 8 x 8 x 31 | 31 | 4543 | 447,5 | 495,2 | 8,8 | 16,88 | 1534 | 151,1 | 229,4 | 5,1 | 4,0 | 22,01 | 141,3 | nc | nc | nsl | nsl | 168 | 203 | 104 | 139 |
| W 8 x 6.5 x 28 | 28 | 4085 | 398,5 | 445,2 | 8,7 | 17,12 | 900,4 | 108,4 | 165,4 | 4,1 | 4,2 | 22,23 | 83,94 | c | c | nsl | nsl | 165 | 196 | 108 | 140 |
| W 8 x 6.5 x 24 | 24 | 3437 | 342,0 | 379,2 | 8,6 | 14,72 | 764,2 | 92,64 | 141,0 | 4,0 | 3,8 | 14,51 | 69,50 | nc | nc | nsl | nsl | 190 | 226 | 124 | 160 |
| W 8 x 5.25 x 21 | 21 | 3141 | 299,1 | 335,7 | 8,8 | 14,96 | 409,6 | 61,13 | 93,79 | 3,1 | 3,6 | 12,00 | 40,82 | c | c | nsl | nsl | 199 | 232 | 138 | 172 |
| W 8 x 5.25 x 18 | 18 | 2584 | 249,7 | 279,4 | 8,7 | 13,41 | 329,8 | 49,59 | 76,15 | 3,1 | 3,1 | 7,199 | 32,47 | c | nc | nsl | nsl | 232 | 271 | 161 | 200 |
| W 8 x 4 x 15 | 15 | 2002 | 194,4 | 222,6 | 8,3 | 14,10 | 142,0 | 27,84 | 43,71 | 2,2 | 3,1 | 5,733 | 13,86 | c | c | nsl | nsl | 241 | 277 | 179 | 215 |
| W 8 x 4 x 13 | 13 | 1659 | 163,5 | 187,7 | 8,1 | 12,98 | 115,4 | 22,62 | 35,66 | 2,1 | 2,8 | 3,678 | 11,09 | c | nc | nsl | nsl | 277 | 318 | 205 | 246 |
| W 8 x 4 x 10 | 10 | 1278 | 127,8 | 145,0 | 8,1 | 9,757 | 86,88 | 17,37 | 27,09 | 2,1 | 2,4 | 1,796 | 8,221 | nc | nc | sl | sl | 355 | 407 | 262 | 314 |
| W 6 x 6 x 25 | 25 | 2219 | 273,9 | 309,7 | 6,8 | 13,88 | 706,8 | 91,79 | 139,9 | 3,8 | 3,8 | 19,19 | 39,93 | c | c | nsl | nsl | 161 | 193 | 101 | 134 |
| W 6 x 6 x 20 | 20 | 1714 | 218,3 | 243,8 | 6,7 | 11,17 | 555,5 | 72,62 | 110,5 | 3,8 | 3,2 | 10,01 | 30,27 | nc | nc | nsl | nsl | 198 | 238 | 123 | 164 |
| W 6 x 6 x 15 | 15 | 1204 | 158,5 | 175,9 | 6,5 | 9,534 | 386,5 | 50,86 | 77,54 | 3,6 | 2,6 | 4,152 | 20,41 | nc | nc | nsl | sl | 260 | 313 | 160 | 214 |
| W 6 x 4 x 16 | 16 | 1342 | 167,8 | 191,4 | 6,6 | 11,42 | 182,5 | 35,79 | 55,24 | 2,4 | 3,4 | 9,232 | 10,20 | c | c | nsl | nsl | 197 | 231 | 138 | 172 |
| W 6 x 4 x 12 | 12 | 914,9 | 119,6 | 135,6 | 6,3 | 9,623 | 125,8 | 24,67 | 38,23 | 2,3 | 2,7 | 3,692 | 6,682 | c | c | nsl | nsl | 258 | 303 | 179 | 223 |
| W 6 x 4 x 9 | 9 | 685,0 | 91,34 | 102,3 | 6,2 | 7,182 | 91,80 | 18,36 | 28,25 | 2,3 | 2,2 | 1,678 | 4,785 | nc | nc | nsl | nsl | 336 | 394 | 231 | 289 |
| W 5 x 5 x 19 | 19 | 1099 | 167,8 | 191,0 | 5,5 | 10,58 | 381,4 | 59,6 | 90,88 | 3,2 | 3,8 | 13,23 | 13,73 | c | c | nsl | nsl | 172 | 207 | 108 | 144 |
| W 5 x 5 x 16 | 16 | 885,5 | 139,4 | 157,1 | 5,4 | 9,197 | 311,0 | 48,97 | 74,66 | 3,2 | 3,3 | 7,99 | 10,79 | c | c | nsl | nsl | 201 | 243 | 126 | 168 |
| W 4 x 4 x 13 | 13 | 475,8 | 89,79 | 103,2 | 4,3 | 8,266 | 160,6 | 31,18 | 47,94 | 2,5 | 3,1 | 6,288 | 3,785 | c | c | nsl | nsl | 201 | 243 | 127 | 169 |

c = compact; nc = non compact; s = slender; nsl = non slender

American standard sections

Dimensions: ASTM A 6/A 6M - Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Flange slope: 1/6

Perfiles americanos de alas inclinadas

Dimensiones: ASTM A 6/A 6M - Tolerancias: ASTM A 6/A 6M

Condición de superficie: según ASTM A 6/A 6M

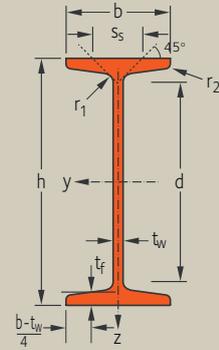
Inclinación de las alas: 1/6

Amerykańskie dwuteowniki standardowe

Wymiary: ASTM A 6/A 6M - Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M

Nachylenie półek: 1/6



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | |
|---|--------------------------------------|---------|---------|----------|----------|----------|----------|---------|---------------------------------------|-------------------------|-------------------------|--|-----------------|
| | G kg/m | h mm | b mm | tw mm | tf mm | r1 mm | r2 mm | d mm | A cm ² | AL m ² /m | AG m ² /t | A709 - Grade 50/50S | A992 - Grade 50 |
| S 610 x 180 | 180 | 622 | 204 | 20,3 | 27,7 | 15,5 | 9,6 | 534,0 | 230,0 | 1,970 | 10,95 | ✓ | ✓ |
| S 610 x 158 | 158 | 622 | 200 | 15,7 | 27,7 | 15,5 | 9,6 | 534,0 | 201,0 | 1,960 | 12,45 | ✓ | ✓ |
| S 610 x 149 | 149 | 610 | 184 | 18,9 | 22,1 | 15,5 | 9,6 | 534,0 | 189,0 | 1,870 | 12,60 | ✓ | ✓ |
| S 610 x 134 | 134 | 610 | 181 | 15,9 | 22,1 | 15,5 | 9,6 | 534,0 | 171,0 | 1,860 | 13,91 | ✓ | ✓ |
| S 610 x 119 | 119 | 610 | 178 | 12,7 | 22,1 | 15,5 | 9,6 | 534,0 | 152,0 | 1,860 | 15,65 | ✓ | ✓ |
| S 510 x 143 | 143 | 516 | 183 | 20,3 | 23,4 | 15,0 | 9,4 | 437,0 | 182,0 | 1,680 | 11,76 | ✓ | ✓ |
| S 510 x 128 | 128 | 516 | 179 | 16,8 | 23,4 | 15,0 | 9,4 | 437,0 | 163,0 | 1,670 | 13,01 | ✓ | ✓ |
| S 510 x 112 | 112 | 508 | 162 | 16,1 | 20,2 | 15,0 | 9,4 | 437,0 | 142,0 | 1,590 | 14,32 | ✓ | ✓ |
| S 510 x 98 | 98 | 508 | 159 | 12,8 | 20,2 | 15,0 | 9,4 | 437,0 | 125,0 | 1,590 | 16,17 | ✓ | ✓ |
| S 460 x 104 | 104 | 457 | 159 | 18,1 | 17,6 | 14,5 | 9,0 | 392,0 | 133,0 | 1,470 | 14,11 | ✓ | ✓ |
| S 460 x 81.4 | 81,4 | 457 | 152 | 11,7 | 17,6 | 14,5 | 9,0 | 392,0 | 104,0 | 1,460 | 17,94 | ✓ | ✓ |
| S 380 x 74 | 74 | 381 | 143 | 14,0 | 15,8 | 13,0 | 7,8 | 322,0 | 94,8 | 1,270 | 17,06 | ✓ | ✓ |
| S 380 x 64 | 64 | 381 | 140 | 10,4 | 15,8 | 13,0 | 6,5 | 322,0 | 81,3 | 1,260 | 19,76 | ✓ | ✓ |
| S 310 x 74 | 74 | 305 | 139 | 17,4 | 16,7 | 14,0 | 6,5 | 243,0 | 94,8 | 1,090 | 14,71 | ✓ | ✓ |
| S 310 x 60.7 | 60,7 | 305 | 133 | 11,7 | 16,7 | 14,0 | 6,5 | 243,0 | 77,4 | 1,080 | 17,85 | ✓ | ✓ |
| S 310 x 52 | 52 | 305 | 129 | 10,9 | 13,8 | 11,5 | 6,5 | 254,0 | 66,5 | 1,070 | 20,53 | ✓ | ✓ |
| S 310 x 47.3 | 47,3 | 305 | 127 | 8,9 | 13,8 | 11,5 | 6,5 | 254,0 | 60,3 | 1,070 | 22,52 | ✓ | ✓ |
| S 250 x 52 | 52 | 254 | 126 | 15,1 | 12,5 | 10,5 | 6,0 | 207,0 | 66,5 | 0,950 | 18,18 | ✓ | ✓ |
| S 250 x 37.8 | 37,8 | 254 | 118 | 7,9 | 12,5 | 10,5 | 6,0 | 207,0 | 48,1 | 0,930 | 24,72 | ✓ | ✓ |
| S 200 x 34 | 34 | 203 | 106 | 11,2 | 10,8 | 9,5 | 5,2 | 161,0 | 43,7 | 0,780 | 22,78 | ✓ | ✓ |
| S 200 x 27.4 | 27,4 | 203 | 102 | 6,9 | 10,8 | 8,5 | 5,0 | 164,0 | 34,8 | 0,770 | 28,26 | ✓ | ✓ |
| S 150 x 25.7 | 25,7 | 152 | 91 | 11,8 | 9,1 | 8,5 | 5,0 | 117,0 | 32,7 | 0,620 | 24,27 | ✓ | ✓ |
| S 150 x 18.6 | 18,6 | 152 | 85 | 5,9 | 9,1 | 7,9 | 4,9 | 117,0 | 23,6 | 0,610 | 32,94 | ✓ | ✓ |
| S 130 x 15 | 15 | 127 | 76 | 5,4 | 8,3 | 7,9 | 4,9 | 94,0 | 18,8 | 0,530 | 35,74 | ✓ | ✓ |
| S 100 x 14.1 | 14,1 | 102 | 71 | 8,3 | 7,4 | 7,5 | 4,8 | 72,0 | 18,0 | 0,450 | 32,26 | ✓ | ✓ |
| S 100 x 11.5 | 11,5 | 102 | 68 | 4,9 | 7,4 | 7,5 | 4,1 | 72,0 | 14,5 | 0,450 | 39,13 | ✓ | ✓ |
| S 75 x 11.2 | 11,2 | 76 | 64 | 8,9 | 6,6 | 7,0 | 3,8 | 48,0 | 14,3 | 0,370 | 33,44 | ✓ | ✓ |
| S 75 x 8.5 | 8,5 | 76 | 59 | 4,3 | 6,6 | 7,0 | 2,1 | 48,0 | 10,8 | 0,360 | 42,59 | ✓ | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do simbolov na stranah 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/AISC 360-16 | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | | |
|---|---|-----------------|-----------------|-----------|-----------------|-----------------|-----------------|-----------------|-----------|-------|-----------------|--------------------------------------|---------------------------------------|------------|---|----------------------|----------------------|----------------------|-----|
| | G | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | Flexure yy | Compression | Contour encasement | | Hollow encasement | |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x 10 ³ | grade 50 | grade 50 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| S 24 x 121 | 121 | 131 200 | 4 217 | 4 996 | 23,9 | 129,0 | 3 427 | 336,0 | 592,0 | 3,9 | 10,4 | 553,0 | 3 022 | c | nsl | 77 | 86 | 64 | 73 |
| S 24 x 106 | 106 | 122 300 | 3 929 | 4 560 | 24,7 | 103,0 | 3 195 | 320,0 | 546,0 | 4,0 | 10,0 | 428,0 | 2 837 | c | nsl | 87 | 97 | 73 | 83 |
| S 24 x 100 | 100 | 99 160 | 3 253 | 3 910 | 22,9 | 118,0 | 1 970 | 214,0 | 393,0 | 3,2 | 9,0 | 333,0 | 1 698 | c | nsl | 89 | 99 | 75 | 85 |
| S 24 x 90 | 90 | 93 500 | 3 067 | 3 631 | 23,4 | 101,0 | 1 857 | 205,0 | 367,0 | 3,3 | 8,7 | 262,0 | 1 612 | c | nsl | 98 | 109 | 83 | 94 |
| S 24 x 80 | 80 | 87 530 | 2 872 | 3 336 | 24,1 | 82,50 | 1 750 | 197,0 | 342,0 | 3,4 | 8,4 | 207,0 | 1 528 | c | sl | 110 | 122 | 93 | 105 |
| S 20 x 96 | 96 | 69 620 | 2 700 | 3 228 | 19,6 | 107,0 | 2 081 | 227,0 | 410,0 | 3,4 | 9,3 | 369,0 | 1 256 | c | nsl | 82 | 92 | 68 | 78 |
| S 20 x 86 | 86 | 65 480 | 2 540 | 2 990 | 20,0 | 90,18 | 1 929 | 216,0 | 378,0 | 3,4 | 9,0 | 287,0 | 1 173 | c | nsl | 90 | 102 | 75 | 86 |
| S 20 x 75 | 75 | 52 980 | 2 086 | 2 485 | 19,4 | 85,23 | 1 226 | 151,0 | 274,0 | 2,9 | 8,1 | 200,0 | 734,0 | c | nsl | 100 | 112 | 84 | 96 |
| S 20 x 66 | 66 | 49 450 | 1 947 | 2 275 | 19,9 | 69,41 | 1 147 | 144,0 | 253,0 | 3,0 | 7,8 | 153,0 | 691,0 | c | nsl | 113 | 126 | 95 | 108 |
| S 18 x 70 | 70 | 38 580 | 1 689 | 2 042 | 17,0 | 85,10 | 1 002 | 126,0 | 238,0 | 2,7 | 7,7 | 190,0 | 483,0 | c | nsl | 98 | 110 | 82 | 94 |
| S 18 x 54.7 | 54,7 | 33 390 | 1 461 | 1 703 | 18,0 | 57,51 | 855,0 | 113,0 | 199,0 | 2,9 | 7,1 | 102,0 | 419,0 | c | nsl | 125 | 140 | 104 | 119 |
| S 15 x 50 | 50 | 20 180 | 1 059 | 1 257 | 14,6 | 55,79 | 645,0 | 90,30 | 164,0 | 2,6 | 6,7 | 94,50 | 216,0 | c | nsl | 118 | 133 | 97 | 112 |
| S 15 x 42.9 | 42,9 | 18 620 | 977,0 | 1 131 | 15,1 | 42,91 | 602,0 | 86,00 | 149,0 | 2,7 | 6,4 | 66,10 | 202,0 | c | nsl | 137 | 155 | 112 | 130 |
| S 12 x 50 | 50 | 12 680 | 832,0 | 996,0 | 11,6 | 55,25 | 652,0 | 93,90 | 169,0 | 2,6 | 7,3 | 130,0 | 134,0 | c | nsl | 100 | 115 | 81 | 96 |
| S 12 x 40.8 | 40,8 | 11 310 | 742,0 | 862,0 | 12,1 | 39,25 | 560,0 | 84,20 | 145,0 | 2,7 | 6,7 | 75,60 | 117,0 | c | nsl | 122 | 139 | 98 | 115 |
| S 12 x 35 | 35 | 9 555 | 627,0 | 730,0 | 12,0 | 35,47 | 408,0 | 63,20 | 112,0 | 2,5 | 5,8 | 47,40 | 87,10 | c | nsl | 141 | 160 | 113 | 133 |
| S 12 x 31.8 | 31,8 | 9 082 | 596,0 | 684,0 | 12,3 | 29,77 | 386,0 | 60,80 | 105,0 | 2,5 | 5,6 | 38,50 | 82,90 | c | nsl | 154 | 176 | 124 | 145 |
| S 10 x 35 | 35 | 6 139 | 483,0 | 579,0 | 9,6 | 39,22 | 349,0 | 55,50 | 103,0 | 2,3 | 5,8 | 61,20 | 50,60 | c | nsl | 123 | 143 | 97 | 117 |
| S 10 x 25.4 | 25,4 | 5 127 | 404,0 | 461,0 | 10,3 | 22,30 | 279,0 | 47,20 | 81,30 | 2,4 | 5,1 | 25,80 | 41,10 | c | nsl | 168 | 193 | 132 | 157 |
| S 8 x 23 | 23 | 2 691 | 265,0 | 313,0 | 7,9 | 23,84 | 178,0 | 33,60 | 60,50 | 2,0 | 4,9 | 25,40 | 16,40 | c | nsl | 154 | 178 | 120 | 145 |
| S 8 x 18.4 | 18,4 | 2 390 | 236,0 | 268,0 | 8,3 | 15,46 | 156,0 | 30,50 | 52,40 | 2,1 | 4,4 | 14,10 | 14,50 | c | nsl | 191 | 220 | 148 | 178 |
| S 6 x 17.25 | 17,3 | 1 089 | 143,0 | 171,0 | 5,8 | 18,54 | 95,90 | 21,10 | 38,90 | 1,7 | 4,4 | 18,50 | 4,870 | c | nsl | 161 | 190 | 124 | 153 |
| S 6 x 12.5 | 12,5 | 913,0 | 120,0 | 137,0 | 6,2 | 10,20 | 75,50 | 17,80 | 30,60 | 1,8 | 3,7 | 7,140 | 3,920 | c | nsl | 219 | 256 | 168 | 204 |
| S 5 x 10 | 10 | 509,0 | 80,20 | 91,40 | 5,2 | 8,070 | 49,20 | 12,90 | 22,30 | 1,6 | 3,5 | 4,920 | 1,770 | c | nsl | 235 | 276 | 179 | 220 |
| S 4 x 9.5 | 9,5 | 283,0 | 55,50 | 65,50 | 4,0 | 9,160 | 36,30 | 10,20 | 18,40 | 1,4 | 3,5 | 5,910 | 0,820 | c | nsl | 210 | 250 | 157 | 198 |
| S 4 x 7.7 | 7,7 | 255,0 | 50,00 | 57,10 | 4,2 | 6,070 | 31,60 | 9,280 | 15,90 | 1,5 | 3,1 | 3,170 | 0,720 | c | nsl | 255 | 303 | 190 | 238 |
| S 3 x 7.5 | 7,5 | 121,0 | 31,90 | 38,20 | 2,9 | 7,230 | 24,30 | 7,590 | 13,60 | 1,3 | 3,3 | 4,970 | 0,290 | c | nsl | 215 | 261 | 156 | 202 |
| S 3 x 5.7 | 5,7 | 105,0 | 27,50 | 31,50 | 3,1 | 4,190 | 18,90 | 6,390 | 10,60 | 1,3 | 2,8 | 1,930 | 0,230 | c | nsl | 278 | 334 | 200 | 256 |

c = compact; nc = non compact; s = slender; nsl = non slender

American wide flange bearing piles

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas anchas para pilotes

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

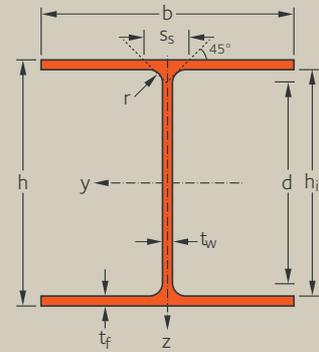
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie pale szerokostopowe

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|-----|----------------|----------------|------|----------------|----|---------------------------------------|-------------------|-------------------|---|-----------------|---------------|----------|-----------------|---|---|
| | h | b | t _w | t _f | r | h _i | d | A | A _L | A _G | A709 - Grade 50/50S | A992 - Grade 50 | A913 | | A 588 - Grade B | | |
| G kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | | Grade 50 & 65 | Grade 70 | | | |
| HP 360 x 174 | 40 | 174 | 361 | 378 | 20,4 | 20,4 | 20 | 320,6 | 280,6 | 222,0 | 2,159 | 12,33 | ✓ | ✓ | ✓ | ✓ | ✓ |
| HP 360 x 152 | 40 | 152 | 356 | 376 | 17,9 | 17,9 | 20 | 320,6 | 280,6 | 194,0 | 2,146 | 13,99 | ✓ | ✓ | ✓ | ✓ | ✓ |
| HP 360 x 132 | 40 | 132 | 351 | 373 | 15,6 | 15,6 | 20 | 320,0 | 280,0 | 168,0 | 2,128 | 15,97 | ✓ | ✓ | ✓ | ✓ | ✓ |
| HP 360 x 108 | 40 | 108 | 346 | 370 | 12,8 | 12,8 | 20 | 320,0 | 280,0 | 138,0 | 2,112 | 19,33 | ✓ | ✓ | - | - | ✓ |
| HP 310 x 132 | 40 | 132 | 314 | 313 | 18,3 | 18,3 | 20 | 277,1 | 237,1 | 167,3 | 1,809 | 13,66 | ✓ | ✓ | ✓ | ✓ | ✓ |
| HP 310 x 125 | 40 | 125 | 312 | 312 | 17,4 | 17,4 | 20 | 277,1 | 237,1 | 159,0 | 1,803 | 14,33 | ✓ | ✓ | ✓ | ✓ | ✓ |
| HP 310 x 110 | 40 | 110 | 308 | 310 | 15,4 | 15,5 | 20 | 277,1 | 237,1 | 141,0 | 1,791 | 16,05 | ✓ | ✓ | ✓ | ✓ | ✓ |
| HP 310 x 93 | 40 | 93 | 303 | 308 | 13,1 | 13,1 | 20 | 277,1 | 237,1 | 119,0 | 1,777 | 18,80 | ✓ | ✓ | - | - | ✓ |
| HP 310 x 79 | 40 | 79 | 299 | 306 | 11,0 | 11,0 | 20 | 277,1 | 237,1 | 100,0 | 1,766 | 22,22 | ✓ | ✓ | - | - | ✓ |
| HP 250 x 85 | | 100 | 254 | 260 | 14,4 | 14,4 | 13 | 225,0 | 199,0 | 108,0 | 1,497 | 17,53 | ✓ | ✓ | ✓ | ✓ | ✓ |
| HP 250 x 62 | | 86 | 246 | 256 | 10,5 | 10,7 | 13 | 225,0 | 199,0 | 80,0 | 1,473 | 23,51 | ✓ | ✓ | - | - | ✓ |
| HP 200 x 53 | | 52 | 204 | 207 | 11,3 | 11,3 | 10 | 181,1 | 161,1 | 68,4 | 1,196 | 22,36 | ✓ | ✓ | - | - | ✓ |
| HP 200 x 43 | | 43 | 200 | 205 | 9,0 | 9,0 | 10 | 182,0 | 162,0 | 54,1 | 1,185 | 27,88 | ✓ | ✓ | - | - | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazy na symboly na stranach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V (m-1) | | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|--------------------------------------|-------------------------------------|----------|-------------|----------|--|----------------------|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywne) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | grade 65 | grade 70 | grade 65 | grade 70 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x 10 ³ | | | | | | | | | |
| HP 14 x 117 | 117 | 51190 | 2836 | 3202 | 15,1 | 81,07 | 18390 | 973,2 | 1495 | 9,0 | 8,4 | 346,1 | 5325 | nc | nc | nsl | nsl | 80 | 97 | 49 | 66 |
| HP 14 x 102 | 102 | 44230 | 2485 | 2787 | 15,0 | 71,11 | 15880 | 844,7 | 1295 | 9,0 | 7,7 | 235,9 | 4532 | nc | nc | nsl | nsl | 91 | 110 | 56 | 75 |
| HP 14 x 89 | 89 | 37830 | 2155 | 2403 | 14,9 | 61,99 | 13500 | 724,3 | 1108 | 8,9 | 7,0 | 157,9 | 3794 | nc | nc | sl | sl | 103 | 125 | 63 | 85 |
| HP 14 x 73 | 73 | 30640 | 1771 | 1960 | 14,8 | 51,2 | 10810 | 584,6 | 893 | 8,8 | 6,1 | 89,67 | 2999 | nc | nc | sl | sl | 125 | 152 | 76 | 103 |
| HP 12 x 89 | 89 | 28940 | 1843 | 2091 | 13,0 | 64,86 | 9373 | 598,9 | 924,3 | 7,4 | 7,8 | 217 | 2044 | nc | nc | nsl | nsl | 89 | 107 | 56 | 74 |
| HP 12 x 84 | 84 | 27290 | 1749 | 1979 | 13,0 | 61,65 | 8826 | 565,7 | 872,3 | 7,4 | 7,5 | 187,3 | 1911 | nc | nc | nsl | nsl | 93 | 113 | 58 | 78 |
| HP 12 x 74 | 74 | 23910 | 1553 | 1746 | 12,9 | 54,67 | 7710 | 497,4 | 765,3 | 7,3 | 6,9 | 133,3 | 1646 | nc | nc | nsl | nsl | 104 | 126 | 65 | 87 |
| HP 12 x 63 | 63 | 19890 | 1313 | 1466 | 12,8 | 46,65 | 6389 | 414,8 | 637 | 7,2 | 6,2 | 83,15 | 1340 | nc | nc | nsl | sl | 122 | 148 | 76 | 102 |
| HP 12 x 53 | 53 | 16530 | 1105 | 1226 | 12,7 | 39,51 | 5259 | 343,7 | 526,7 | 7,2 | 5,6 | 51,23 | 1089 | nc | nc | sl | sl | 144 | 174 | 89 | 120 |
| HP 10 x 57 | 57 | 12300 | 968,8 | 1095 | 10,6 | 39,69 | 4225 | 325 | 499,8 | 6,2 | 5,8 | 83,18 | 605,4 | nc | nc | nsl | nsl | 114 | 138 | 71 | 95 |
| HP 10 x 42 | 42 | 8753 | 711,6 | 792,8 | 10,4 | 28,93 | 2995 | 233,9 | 357,9 | 6,1 | 4,7 | 34,09 | 414,1 | nc | nc | sl | sl | 152 | 185 | 94 | 126 |
| HP 8 x 36 | 35 | 4977 | 487,9 | 551,2 | 8,5 | 24,89 | 1673 | 161,6 | 248,5 | 4,9 | 4,5 | 31,94 | 155,0 | nc | nc | nsl | nsl | 145 | 176 | 90 | 121 |
| HP 8 x 29 | 29 | 3887 | 388,7 | 434,5 | 8,4 | 19,84 | 1293 | 126,2 | 193,3 | 4,8 | 3,8 | 16,34 | 117,8 | nc | nc | nsl | sl | 181 | 219 | 112 | 150 |

c = compact; nc = non compact; s = slender; nsl = non slender

American standard channels

Flange slope: approx. 16 2/3% - Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos estándar de alas inclinadas

Inclinación de las alas: approx. 16 2/3% - Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

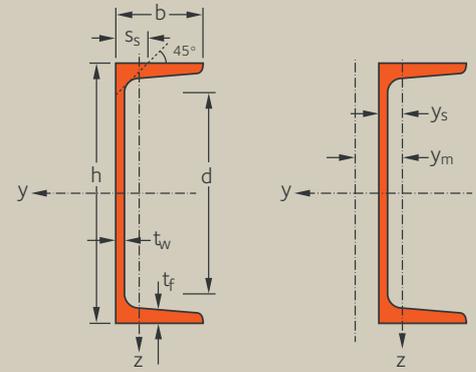
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie ceowniki standardowe

Pochylenie półek: approx. 16 2/3% - Dimensiones: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | Surface Superficie Powierzchnia | | | Steel grades Grados de acero Gatunki stali | |
|---|--------------------------------------|-----|----------------|----------------|------|---------------------------------------|-------------------|-------------------|--|---|
| G | h | b | t _w | t _f | d | A | A _L | A _G | A992 - Grade 50 | |
| kg/m | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | | |
| C 310 x 45 40 | 45 | 305 | 80 | 13 | 12,7 | 248 | 56,9 | 0,824 | 18,27 | ✓ |
| C 310 x 37 | 37 | 305 | 77 | 9,8 | 12,7 | 248 | 47,4 | 0,841 | 22,71 | ✓ |
| C 310 x 30,8 | 30,8 | 305 | 74 | 7,2 | 12,7 | 248 | 39,3 | 0,825 | 26,60 | ✓ |
| C 250 x 37 40 | 37 | 254 | 73 | 13,4 | 11,1 | 203 | 47,4 | 0,713 | 19,52 | ✓ |
| C 250 x 30 | 30 | 254 | 69 | 9,6 | 11,1 | 203 | 37,9 | 0,701 | 23,98 | ✓ |
| C 250 x 22,8 | 22,8 | 254 | 65 | 6,1 | 11,1 | 203 | 29,0 | 0,692 | 30,85 | ✓ |
| C 200 x 20,5 | 20,5 | 203 | 59 | 7,7 | 9,9 | 156 | 26,1 | 0,577 | 28,82 | ✓ |
| C 200 x 17,1 | 17,1 | 203 | 57 | 5,6 | 9,9 | 156 | 21,8 | 0,564 | 33,22 | ✓ |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazy na symboly na stranach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | |
|---|---|-----------------|------------------|------------------|-----------------|---|-----------------|------------------|------------------|----------------|-----------------|-----------------|----------------|----------------|----------------|-------------------------------------|-------------|--|----------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | | | | | Flexure yy | Compression | Contour encasement | | Hollow encasement | |
| | G | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | y _s | y _m | | | grade 50 | grade 50 | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| lb/ft | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | cm | cm | | | | | | | |
| C 12 x 30 | 30 | 6720 | 441,0 | 551,0 | 10,9 | 42,50 | 209,0 | 33,20 | 72,10 | 1,9 | 4,2 | 39,20 | 34,40 | 1,70 | 3,24 | c | sl | 131 | 145 | 121 | 135 |
| C 12 x 25 | 25 | 5970 | 391,0 | 477,0 | 11,2 | 31,30 | 183,0 | 30,50 | 66,00 | 2,0 | 3,4 | 21,90 | 29,50 | 1,70 | 3,58 | sl | sl | 161 | 177 | 145 | 161 |
| C 12 x 20.7 | 20,7 | 5340 | 350,0 | 415,0 | 11,7 | 24,50 | 157,0 | 27,70 | 60,20 | 2,0 | 3,5 | 16,00 | 24,80 | 1,74 | 3,91 | sl | sl | 191 | 210 | 174 | 193 |
| C 10 x 25 | 25 | 3790 | 298,0 | 377,0 | 8,9 | 35,20 | 138,0 | 24,00 | 52,60 | 1,7 | 3,4 | 28,60 | 16,20 | 1,56 | 2,80 | c | sl | 135 | 150 | 123 | 138 |
| C 10 x 20 | 20 | 3260 | 257,0 | 315,0 | 9,3 | 26,10 | 114,0 | 21,20 | 46,50 | 1,7 | 3,4 | 15,70 | 13,10 | 1,53 | 3,13 | sl | sl | 167 | 185 | 152 | 170 |
| C 10 x 15.3 | 15,3 | 2770 | 218,0 | 257,0 | 9,8 | 17,60 | 91,20 | 18,50 | 40,30 | 1,8 | 3,2 | 9,15 | 10,40 | 1,58 | 3,55 | sl | sl | 216 | 239 | 198 | 220 |
| C 8 x 13.75 | 13,75 | 1490 | 147,0 | 177,0 | 7,6 | 16,70 | 62,00 | 13,70 | 30,00 | 1,5 | 2,8 | 7,600 | 4,500 | 1,39 | 2,90 | sl | sl | 198 | 221 | 178 | 201 |
| C 8 x 11.5 | 11,5 | 1340 | 132,0 | 156,0 | 7,9 | 13,20 | 53,80 | 12,60 | 27,60 | 1,6 | 2,9 | 5,860 | 3,790 | 1,44 | 3,19 | sl | sl | 233 | 259 | 212 | 239 |

c = compact; nc = non compact; s = slender; nsl = non slender

American channels

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos de alas inclinadas

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

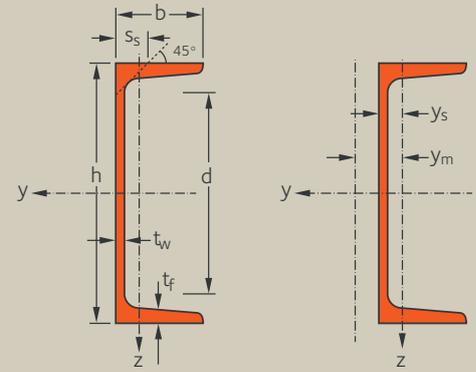
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie ceowniki

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | Surface Superficie Powierzchnia | | | Steel grades Grados de acero Gatunki stali | | | |
|---|--------------------------------------|---------|---------|----------------------|----------------------|---------------------------------------|----------------------|-------------------------------------|--|---------------------|-----------------|-----------------|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | d mm | A cm ² | A _L m ² /m | A _G m ² /t | A709 - Grade 50/50S | A992 - Grade 50 | A572 - Grade 60 |
| MC 460 x 86 | 86 | 457 | 107 | 17,8 | 15,9 | 375 | 110,0 | 1,300 | 15,09 | ✓ | ✓ | ✓ |
| MC 460 x 77.2 | 77,2 | 457 | 104 | 15,2 | 15,9 | 366 | 98,7 | 1,290 | 16,71 | ✓ | ✓ | ✓ |
| MC 460 x 68.2 | 68,2 | 457 | 102 | 12,7 | 15,9 | 370 | 87,1 | 1,290 | 18,91 | ✓ | ✓ | ✓ |
| MC 460 x 63.5 | 63,5 | 457 | 100 | 11,4 | 15,9 | 366 | 81,3 | 1,280 | 20,18 | ✓ | ✓ | ✓ |
| MC 310 x 74 | 74 | 305 | 105 | 21,2 | 17,8 | 222 | 94,8 | 0,980 | 13,21 | ✓ | ✓ | ✓ |
| MC 310 x 67 | 67 | 305 | 102 | 18 | 17,8 | 214 | 85,0 | 0,970 | 14,53 | ✓ | ✓ | ✓ |
| MC 310 x 60 | 60 | 305 | 98 | 15 | 17,8 | 214 | 76,1 | 0,960 | 16,17 | ✓ | ✓ | ✓ |
| MC 310 x 52 | 52 | 305 | 96 | 11,8 | 17,8 | 218 | 66,2 | 0,960 | 18,52 | ✓ | ✓ | ✓ |
| MC 310 x 46 | 46 | 305 | 93 | 9,4 | 17,8 | 225 | 58,9 | 0,960 | 20,95 | ✓ | ✓ | ✓ |
| MC 250 x 61.2 | 61,2 | 254 | 110 | 20,2 | 14,6 | 170 | 78,1 | 0,890 | 14,55 | ✓ | ✓ | ✓ |
| MC 250 x 50 | 50 | 254 | 104 | 14,6 | 14,6 | 178 | 63,7 | 0,880 | 17,63 | ✓ | ✓ | ✓ |
| MC 250 x 42.4 | 42,4 | 254 | 100 | 10,8 | 14,6 | 178 | 54,0 | 0,870 | 20,51 | ✓ | ✓ | ✓ |
| MC 250 x 37 | 37 | 254 | 86 | 9,7 | 14,6 | 186 | 47,4 | 0,820 | 22,09 | ✓ | ✓ | ✓ |
| MC 250 x 33 | 33 | 254 | 84 | 7,4 | 14,6 | 179 | 41,6 | 0,810 | 24,70 | ✓ | ✓ | ✓ |
| MC 230 x 37.8 | 37,8 | 229 | 88 | 11,4 | 14 | 155 | 48,2 | 0,770 | 20,43 | ✓ | ✓ | ✓ |
| MC 230 x 35.6 | 35,6 | 229 | 87 | 10,2 | 14 | 158 | 45,3 | 0,770 | 21,65 | ✓ | ✓ | ✓ |
| MC 200 x 33.9 | 33,9 | 203 | 88 | 10,8 | 13,3 | 130 | 43,2 | 0,720 | 21,30 | ✓ | ✓ | ✓ |
| MC 200 x 31.8 | 31,8 | 203 | 87 | 9,5 | 13,3 | 132 | 40,5 | 0,720 | 22,66 | ✓ | ✓ | ✓ |
| MC 200 x 29.8 | 29,8 | 203 | 76 | 10,2 | 12,7 | 136 | 37,9 | 0,680 | 22,71 | ✓ | ✓ | ✓ |
| MC 200 x 27.8 | 27,8 | 203 | 75 | 9 | 12,7 | 140 | 35,5 | 0,680 | 24,29 | ✓ | ✓ | ✓ |
| MC 180 x 33.8 | 33,8 | 178 | 91 | 12,8 | 12,7 | 109 | 43,0 | 0,680 | 20,12 | ✓ | ✓ | ✓ |
| MC 180 x 28.4 | 28,4 | 178 | 87 | 8,9 | 12,7 | 110 | 36,2 | 0,670 | 23,63 | ✓ | ✓ | ✓ |
| MC 150 x 26.8 | 26,8 | 152 | 88 | 9,6 | 12,1 | 85,4 | 34,1 | 0,620 | 23,28 | ✓ | ✓ | ✓ |
| MC 150 x 24.3 | 24,3 | 152 | 76 | 9,5 | 12,1 | 88,2 | 30,9 | 0,570 | 23,68 | ✓ | ✓ | ✓ |
| MC 150 x 22.8 | 22,8 | 152 | 88 | 8,6 | 9,8 | 91,7 | 29,0 | 0,620 | 27,36 | ✓ | ✓ | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazy na symboly na stranach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | | Classification ANSI/ AISC 360-16 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m-1] | | | | |
|---|---|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|------------------------------------|---|-------------------------------------|-------------------------------------|----------------------|----------------------|-----------------------------------|---|----------------------|-------------------------------------|-----------------------|----------|----------------------|--|----------------------|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (szywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiatka) | | | | | Flexure yy | | Compression | | Contour encasement | | Hollow encasement | | | | | |
| | G lb/ft | I _y cm ⁴ | W _{ely} cm ³ | W _{ply} cm ³ | i _y cm | A _{vz} cm ² | I _z cm ⁴ | W _{elz} cm ³ | W _{plz} cm ³ | i _z cm | S _s cm | I _t cm ⁴ | I _w cm ⁶ x10 ³ | y _s cm | y _m cm | grade 50 | grade 60 | grade 50 | grade 60 | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| MC 18 x 58 | 58 | 27850 | 1219 | 1587 | 16,0 | 83,20 | 682,0 | 79,30 | 173,0 | 2,5 | 4,9 | 141,0 | 303,0 | 2,1 | 3,7 | c | sl | sl | sl | 108 | 118 | 93 | 103 |
| MC 18 x 51.9 | 51,9 | 26090 | 1142 | 1463 | 16,3 | 72,60 | 611,0 | 73,20 | 159,0 | 2,5 | 4,9 | 116,0 | 276,0 | 2,1 | 3,8 | c | sl | sl | sl | 120 | 131 | 103 | 114 |
| MC 18 x 45.8 | 45,8 | 24010 | 1051 | 1330 | 16,6 | 61,20 | 576,0 | 70,90 | 149,0 | 2,6 | 4,6 | 81,80 | 254,0 | 2,1 | 4,2 | c | sl | sl | sl | 136 | 148 | 117 | 128 |
| MC 18 x 42.7 | 42,7 | 23040 | 1008 | 1263 | 16,9 | 55,70 | 535,0 | 67,40 | 141,0 | 2,6 | 4,6 | 73,30 | 237,0 | 2,1 | 4,2 | c | sl | sl | sl | 145 | 157 | 125 | 137 |
| MC 12 x 50 | 50 | 11140 | 731,0 | 939,0 | 10,9 | 65,90 | 664,0 | 83,50 | 175,0 | 2,7 | 5,4 | 164,0 | 116,0 | 2,6 | 4,2 | c | sl | sl | sl | 92 | 103 | 75 | 86 |
| MC 12 x 45 | 45 | 10510 | 689,0 | 873,0 | 11,1 | 57,40 | 597,0 | 77,50 | 161,0 | 2,7 | 5,3 | 131,0 | 105,0 | 2,5 | 4,4 | c | sl | sl | sl | 102 | 114 | 84 | 96 |
| MC 12 x 40 | 40 | 9732 | 638,0 | 798,0 | 11,3 | 48,70 | 526,0 | 71,50 | 146,0 | 2,6 | 5,0 | 97,70 | 91,50 | 2,5 | 4,6 | c | sl | sl | sl | 113 | 126 | 93 | 106 |
| MC 12 x 35 | 35 | 8998 | 590,0 | 726,0 | 11,7 | 39,10 | 487,0 | 68,70 | 138,0 | 2,7 | 4,6 | 70,10 | 82,10 | 2,6 | 5,0 | c | sl | sl | sl | 131 | 145 | 107 | 121 |
| MC 12 x 31 | 31 | 8292 | 544,0 | 661,0 | 12,0 | 31,40 | 436,0 | 65,00 | 129,0 | 2,7 | 4,1 | 53,40 | 70,60 | 2,6 | 5,3 | c | sl | sl | sl | 147 | 163 | 119 | 135 |
| MC 10 x 41.1 | 41,1 | 6550 | 516,0 | 654,0 | 9,2 | 51,70 | 582,0 | 69,20 | 146,0 | 2,7 | 5,1 | 124,0 | 65,20 | 2,6 | 4,3 | c | sl | sl | sl | 100 | 114 | 79 | 93 |
| MC 10 x 33.6 | 33,6 | 5750 | 453,0 | 558,0 | 9,5 | 37,90 | 498,0 | 63,80 | 126,0 | 2,8 | 4,3 | 58,00 | 52,70 | 2,6 | 4,7 | c | sl | sl | sl | 122 | 138 | 96 | 112 |
| MC 10 x 28.5 | 28,5 | 5257 | 414,0 | 496,0 | 9,9 | 29,00 | 433,0 | 59,00 | 114,0 | 2,8 | 4,0 | 38,20 | 44,50 | 2,6 | 5,1 | c | sl | sl | sl | 143 | 161 | 113 | 131 |
| MC 10 x 25 | 25 | 4543 | 358,0 | 430,0 | 9,8 | 25,80 | 285,0 | 45,30 | 86,50 | 2,5 | 3,6 | 28,20 | 28,90 | 2,3 | 4,4 | c | sl | sl | sl | 155 | 173 | 125 | 143 |
| MC 10 x 22 | 22 | 4310 | 339,0 | 397,0 | 10,1 | 21,00 | 255,0 | 42,20 | 81,30 | 2,5 | 3,6 | 24,40 | 25,80 | 2,3 | 4,7 | c | sl | sl | sl | 175 | 195 | 142 | 163 |
| MC 9 x 25.4 | 25,4 | 3670 | 321,0 | 389,0 | 8,7 | 27,50 | 286,0 | 43,90 | 86,30 | 2,4 | 3,9 | 34,50 | 24,20 | 2,3 | 4,3 | c | sl | sl | sl | 141 | 160 | 113 | 132 |
| MC 9 x 23.9 | 23,9 | 3547 | 310,0 | 373,0 | 8,8 | 24,70 | 275,0 | 43,20 | 83,80 | 2,5 | 3,7 | 28,80 | 22,90 | 2,3 | 4,4 | c | sl | sl | sl | 151 | 170 | 120 | 140 |
| MC 8 x 22.8 | 22,8 | 2645 | 261,0 | 314,0 | 7,8 | 23,40 | 262,0 | 40,70 | 80,30 | 2,5 | 3,8 | 29,80 | 17,30 | 2,3 | 4,4 | c | sl | sl | sl | 146 | 167 | 114 | 135 |
| MC 8 x 21.4 | 21,4 | 2555 | 252,0 | 300,0 | 7,9 | 20,80 | 251,0 | 40,00 | 78,00 | 2,5 | 3,6 | 24,50 | 16,20 | 2,4 | 4,6 | c | sl | sl | sl | 156 | 178 | 122 | 143 |
| MC 8 x 20 | 20 | 2261 | 223,0 | 271,0 | 7,7 | 21,90 | 167,0 | 29,80 | 58,70 | 2,1 | 3,5 | 22,30 | 11,20 | 2,0 | 3,7 | c | sl | sl | sl | 159 | 179 | 127 | 147 |
| MC 8 x 18.7 | 18,7 | 2171 | 214,0 | 258,0 | 7,8 | 19,40 | 160,0 | 29,30 | 56,80 | 2,1 | 3,3 | 17,90 | 10,40 | 2,0 | 3,8 | c | sl | sl | sl | 170 | 192 | 135 | 157 |
| MC 7 x 22.7 | 22,7 | 1973 | 222,0 | 271,0 | 6,8 | 23,70 | 271,0 | 40,80 | 80,90 | 2,5 | 3,9 | 32,90 | 13,60 | 2,4 | 4,5 | c | sl | sl | sl | 137 | 158 | 104 | 125 |
| MC 7 x 19.1 | 19,1 | 1797 | 202,0 | 239,0 | 7,1 | 17,30 | 230,0 | 37,40 | 72,20 | 2,5 | 3,5 | 20,20 | 11,20 | 2,5 | 4,8 | c | sl | sl | sl | 161 | 185 | 122 | 146 |
| MC 6 x 18 | 18,0 | 1223 | 161,0 | 192,0 | 6,0 | 15,80 | 219,0 | 35,40 | 68,70 | 2,5 | 3,5 | 19,70 | 7,700 | 2,5 | 4,9 | c | sl | sl | sl | 156 | 182 | 115 | 141 |
| MC 6 x 16.3 | 16,3 | 1081 | 142,0 | 171,0 | 5,9 | 15,50 | 147,0 | 27,20 | 53,30 | 2,2 | 3,4 | 17,10 | 5,180 | 2,2 | 4,1 | c | sl | sl | sl | 160 | 184 | 123 | 148 |
| MC 6 x 15.3 | 15,3 | 1050 | 138,0 | 164,0 | 6,0 | 14,20 | 178,0 | 27,90 | 55,20 | 2,5 | 3,1 | 12,90 | 6,580 | 2,3 | 4,5 | c | sl | sl | sl | 183 | 214 | 135 | 166 |

c = compact; nc = non compact; s = slender; nsl = non slender

American equal leg angles

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos angulares de lados iguales

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

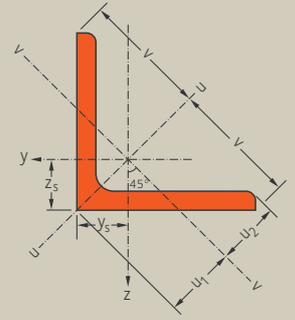
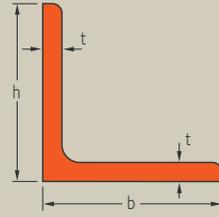
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie kątowniki równoramienne

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | | Surface Superficie Powierzchni | | | Position of axes Posición de los ejes Położenie osi | | | | Steel grades Calidades de acero Gatunki stali | | | | |
|---|--------------------------------------|-----------|---------|----------------------|----------------------|----------------------|--------------------------------------|-------------------------------------|-------------------------------------|---|---------|----------------------|----------------------|---|-----------------|----------|----------|----------------|
| | G kg/m | h=b mm | t mm | r ₁ mm | r ₂ mm | r ₃ mm | A cm ² | A _L m ² /m | A _G m ² /t | z _s =y _s cm | v cm | u ₁ cm | u ₂ cm | A709 - Grade 50/50S | A992 - Grade 50 | A572 | | A588 - Grade B |
| | | | | | | | | | | | | | | | | Grade 50 | Grade 65 | |
| L 305 x 305 x 34.9 ☎ | 157 | 305 | 34,9 | 18 | 12,7 | 15 | 199,0 | 1,183 | 7,56 | 8,9 | 21,6 | 12,5 | 11,5 | - | ✓ | ✓ | ✓ | - |
| L 305 x 305 x 31.8 | 143 | 305 | 31,8 | 18 | 12,7 | 15 | 183,0 | 1,183 | 8,26 | 8,7 | 21,6 | 12,3 | 11,5 | - | ✓ | ✓ | ✓ | - |
| L 305 x 305 x 28.6 | 130 | 305 | 28,6 | 18 | 12,7 | 15 | 165,0 | 1,183 | 9,14 | 8,6 | 21,6 | 12,2 | 11,4 | - | ✓ | ✓ | ✓ | - |
| L 305 x 305 x 25.4 | 116 | 305 | 25,4 | 18 | 12,7 | 15 | 147,0 | 1,183 | 10,24 | 8,5 | 21,6 | 12,0 | 11,4 | - | ✓ | ✓ | ✓ | - |
| L 254 x 254 x 34.9 | 130 | 254 | 34,9 | 18 | 9 | 3 | 165,0 | 0,992 | 7,65 | 7,6 | 18,0 | 10,7 | 9,7 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 254 x 254 x 31.8 | 119 | 254 | 31,8 | 18 | 9 | 3 | 151,0 | 0,992 | 8,34 | 7,5 | 18,0 | 10,6 | 9,6 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 254 x 254 x 28.6 | 108 | 254 | 28,6 | 18 | 9 | 3 | 137,0 | 0,992 | 9,21 | 7,4 | 18,0 | 10,4 | 9,6 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 254 x 254 x 25.4 | 96,2 | 254 | 25,4 | 18 | 9 | 3 | 123,0 | 0,992 | 10,31 | 7,2 | 18,0 | 10,2 | 9,5 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 254 x 254 x 22.2 | 84,6 | 254 | 22,2 | 18 | 9 | 3 | 108,0 | 0,992 | 11,71 | 7,1 | 18,0 | 10,1 | 9,5 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 254 x 254 x 19.1 | 73,1 | 254 | 19,1 | 18 | 9 | 3 | 93,1 | 0,992 | 13,56 | 7,0 | 18,0 | 9,9 | 9,4 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 203 x 28.6 | 84,7 | 203 | 28,6 | - | - | - | 108,0 | 0,808 | 9,54 | 6,1 | 14,4 | 8,7 | 7,6 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 203 x 25.4 | 75,9 | 203 | 25,4 | - | - | - | 96,8 | 0,807 | 10,63 | 6,0 | 14,4 | 8,5 | 7,5 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 203 x 22.2 | 67,0 | 203 | 22,2 | - | - | - | 85,0 | 0,809 | 12,07 | 5,9 | 14,4 | 8,3 | 7,5 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 203 x 19.0 | 57,9 | 203 | 19,1 | - | - | - | 73,6 | 0,809 | 13,97 | 5,8 | 14,4 | 8,2 | 7,4 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 203 x 15.9 ☎ | 48,7 | 203 | 15,9 | - | - | - | 62,0 | 0,809 | 16,61 | 5,7 | 14,4 | 8,0 | 7,4 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 203 x 14.3 | 44,0 | 203 | 14,3 | - | - | - | 56,0 | 0,809 | 18,39 | 5,6 | 14,4 | 7,9 | 7,4 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 203 x 12.7 | 39,3 | 203 | 12,7 | - | - | - | 50,0 | 0,808 | 20,56 | 5,5 | 14,4 | 7,8 | 7,3 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 152 x 152 x 25.4 | 55,7 | 152 | 25,4 | - | - | - | 71,0 | 0,605 | 10,86 | 4,7 | 10,8 | 6,7 | 5,8 | - | - | ✓ | - | - |
| L 152 x 152 x 22.2 | 49,3 | 152 | 22,2 | - | - | - | 62,8 | 0,605 | 12,27 | 4,6 | 10,8 | 6,5 | 5,7 | - | - | ✓ | - | - |
| L 152 x 152 x 19.0 | 42,7 | 152 | 19,1 | - | - | - | 54,5 | 0,606 | 14,19 | 4,5 | 10,8 | 6,4 | 5,7 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 152 x 152 x 15.9 | 36,0 | 152 | 15,9 | - | - | - | 45,9 | 0,605 | 16,81 | 4,4 | 10,8 | 6,2 | 5,6 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 152 x 152 x 14.3 | 32,6 | 152 | 14,3 | - | - | - | 41,5 | 0,605 | 18,56 | 4,3 | 10,8 | 6,1 | 5,6 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 152 x 152 x 12.7 | 29,2 | 152 | 12,7 | - | - | - | 37,1 | 0,603 | 20,65 | 4,3 | 10,8 | 6,0 | 5,5 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 152 x 152 x 11.1 | 25,6 | 152 | 11,1 | - | - | - | 32,7 | 0,605 | 23,63 | 4,2 | 10,8 | 6,0 | 5,5 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 152 x 152 x 9.5 ☎ | 22,2 | 152 | 9,53 | - | - | - | 28,1 | 0,602 | 27,12 | 4,1 | 10,8 | 5,9 | 5,4 | ✓ | ✓ | ✓ | ✓ | ✓ |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | Classification ANSI/AISC 360-16 | | |
|---|---|---------------------|-------------|-------------------------------|-------|-------------------------------|-------|-----------------|------------------------------------|----------|-----|
| | axis y-y / axis z-z eje y-y / eje z-z oś y-y / oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | I_{yz} | Compression | | |
| | $I_y = I_z$ | $W_{ely} = W_{edz}$ | $i_y = i_z$ | I_u | i_u | I_v | i_v | | grade 50 | grade 65 | |
| lb/ft | cm ⁴ | cm ³ | cm | cm ⁴ | cm | cm ⁴ | cm | cm ⁴ | | | |
| L 12 x 12 x 1 3/8 | 105 | 17090 | 789,9 | 9,26 | 27170 | 11,67 | 7008 | 5,93 | -10080 | nsl | nsl |
| L 12 x 12 x 1 1/4 | 96,4 | 15770 | 725,0 | 9,29 | 25100 | 11,73 | 6441 | 5,94 | -9329 | nsl | nsl |
| L 12 x 12 x 1 1/8 | 87,2 | 14370 | 656,7 | 9,33 | 22890 | 11,78 | 5847 | 5,95 | -8520 | nsl | nsl |
| L 12 x 12 x 1 | 77,8 | 12920 | 587,1 | 9,37 | 20590 | 11,83 | 5242 | 5,97 | -7676 | nsl | nsl |
| L 10 x 10 x 1 3/8 | 87,1 | 9648 | 541,7 | 7,64 | 15280 | 9,62 | 4017 | 4,93 | -5632 | nsl | nsl |
| L 10 x 10 x 1 1/4 | 79,9 | 8933 | 498,3 | 7,68 | 14170 | 9,67 | 3698 | 4,94 | -5236 | nsl | nsl |
| L 10 x 10 x 1 1/8 | 72,3 | 8168 | 452,6 | 7,72 | 12970 | 9,73 | 3364 | 4,95 | -4804 | nsl | nsl |
| L 10 x 10 x 1 | 64,7 | 7374 | 405,8 | 7,76 | 11720 | 9,78 | 3024 | 4,97 | -4350 | nsl | nsl |
| L 10 x 10 x 7/8 | 56,9 | 6549 | 357,9 | 7,79 | 10420 | 9,83 | 2678 | 4,98 | -3871 | nsl | nsl |
| L 10 x 10 x 3/4 | 49,1 | 5707 | 309,8 | 7,83 | 9085 | 9,88 | 2329 | 5,00 | -3378 | nsl | nsl |
| L 8 x 8 x 1 1/8 | 56,9 | 4071 | 286,7 | 6,14 | 6448 | 7,73 | 1694 | 3,96 | -2377 | nsl | nsl |
| L 8 x 8 x 1 | 51 | 3693 | 258,0 | 6,18 | 5863 | 7,79 | 1523 | 3,97 | -2170 | nsl | nsl |
| L 8 x 8 x 7/8 | 45 | 3310 | 229,4 | 6,23 | 5264 | 7,85 | 1356 | 3,99 | -1954 | nsl | nsl |
| L 8 x 8 x 3/4 | 38,9 | 2900 | 199,4 | 6,27 | 4619 | 7,91 | 1181 | 4,00 | -1719 | nsl | nsl |
| L 8 x 8 x 5/8 | 32,7 | 2471 | 168,6 | 6,31 | 3941 | 7,97 | 1001 | 4,02 | -1470 | nsl | nsl |
| L 8 x 8 x 9/16 | 29,6 | 2249 | 152,8 | 6,33 | 3589 | 8,00 | 909 | 4,03 | -1340 | nsl | nsl |
| L 8 x 8 x 1/2 | 26,4 | 2021 | 136,7 | 6,36 | 3226 | 8,03 | 816 | 4,04 | -1205 | nsl | nsl |
| L 6 x 6 x 1 | 37,4 | 1475 | 140,4 | 4,56 | 2326 | 5,72 | 624,4 | 2,97 | -850,6 | nsl | - |
| L 6 x 6 x 7/8 | 33,1 | 1327 | 124,9 | 4,60 | 2100 | 5,78 | 554,1 | 2,97 | -772,9 | nsl | - |
| L 6 x 6 x 3/4 | 28,7 | 1171 | 109,1 | 4,64 | 1859 | 5,84 | 483,3 | 2,98 | -687,7 | nsl | nsl |
| L 6 x 6 x 5/8 | 24,2 | 1004 | 92,53 | 4,68 | 1598 | 5,90 | 410,5 | 2,99 | -593,5 | nsl | nsl |
| L 6 x 6 x 9/16 | 21,9 | 917,2 | 84,08 | 4,70 | 1461 | 5,93 | 373,7 | 3,00 | -543,5 | nsl | nsl |
| L 6 x 6 x 1/2 | 19,6 | 825,3 | 75,18 | 4,71 | 1315 | 5,95 | 335,8 | 3,01 | -489,5 | nsl | nsl |
| L 6 x 6 x 7/16 | 17,2 | 734,7 | 66,63 | 4,74 | 1172 | 5,99 | 297,5 | 3,02 | -437,2 | nsl | nsl |
| L 6 x 6 x 3/8 | 14,9 | 637,5 | 57,41 | 4,75 | 1016 | 6,00 | 258,9 | 3,03 | -378,6 | nsl | nsl |

c = compact; nc = non compact; s = slender; nsl = non slender

American equal leg angles (continued)

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos angulares de lados iguales (continúa)

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

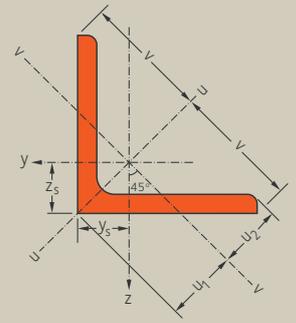
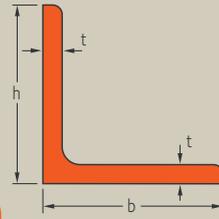
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie kątowniki równoramienne (ciąg dalszy)

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | | | Surface Superficie Powierzchni | | | Position of axes Posición de los ejes Położenie osi | | | | Steel grades Calidades de acero Gatunki stali | | | | | |
|---|--------------------------------------|------|------|----------------|----------------|--------------------------------------|-----------------|-------------------|---|--------------------------------|----|----------------|---|---------------------|-----------------|----------|----------|----------------|
| | G | h=b | t | r ₁ | r ₂ | r ₃ | A | A _L | A _G | z _s =y _s | v | u ₁ | u ₂ | A709 - Grade 50/50S | A992 - Grade 50 | A572 | | A588 - Grade B |
| kg/m | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | cm | cm | cm | cm | | | Grade 50 | Grade 65 | |
| L 127 x 127 x 15.9 | 29,8 | 127 | 15,9 | 37,8 | 0,502 | 16,85 | 3,8 | 9,0 | 5,3 | 4,7 | ✓ | ✓ | ✓ | - | - | | | |
| L 127 x 127 x 12.7 | 24,1 | 127 | 12,7 | 30,7 | 0,501 | 20,79 | 3,6 | 9,0 | 5,1 | 4,6 | ✓ | ✓ | ✓ | - | - | | | |
| L 127 x 127 x 11.1 | 21,3 | 127 | 11,1 | 27,0 | 0,500 | 23,47 | 3,6 | 9,0 | 5,0 | 4,6 | ✓ | ✓ | ✓ | - | - | | | |
| L 127 x 127 x 9.5 | 18,3 | 127 | 9,53 | 23,3 | 0,505 | 27,60 | 3,5 | 9,0 | 5,0 | 4,6 | ✓ | ✓ | ✓ | - | - | | | |
| L 127 x 127 x 7.9 | 15,3 | 127 | 7,94 | 19,6 | 0,505 | 33,01 | 3,5 | 9,0 | 4,9 | 4,6 | ✓ | ✓ | ✓ | - | - | | | |
| L 102 x 102 x 11.1 | 16,8 | 102 | 11,1 | 21,4 | 0,402 | 23,93 | 2,9 | 7,2 | 4,2 | 3,7 | - | ✓ | ✓ | - | - | | | |
| L 102 x 102 x 9.5 | 14,6 | 102 | 9,53 | 18,5 | 0,399 | 27,33 | 2,9 | 7,2 | 4,1 | 3,6 | - | ✓ | ✓ | - | - | | | |
| L 102 x 102 x 7.9 | 12,2 | 102 | 7,94 | 15,5 | 0,402 | 32,95 | 2,8 | 7,2 | 4,0 | 3,7 | - | ✓ | ✓ | - | - | | | |
| L 89 x 89 x 9.5 | 12,6 | 88,9 | 9,53 | 16,0 | 0,351 | 27,86 | 2,6 | 6,3 | 3,6 | 3,2 | - | ✓ | ✓ | - | - | | | |
| L 89 x 89 x 7.9 | 10,7 | 88,9 | 7,94 | 13,5 | 0,348 | 32,52 | 2,5 | 6,3 | 3,5 | 3,2 | - | ✓ | ✓ | - | - | | | |
| L 89 x 89 x 6.4 | 8,6 | 88,9 | 6,35 | 10,9 | 0,349 | 40,58 | 2,4 | 6,3 | 3,4 | 3,1 | - | ✓ | ✓ | - | - | | | |
| L 76 x 76 x 9.5 | 10,7 | 76,2 | 9,53 | 13,6 | 0,301 | 28,13 | 2,3 | 5,4 | 3,2 | 2,8 | - | ✓ | ✓ | - | - | | | |
| L 76 x 76 x 7.9 | 9,1 | 76,2 | 7,94 | 11,5 | 0,298 | 32,75 | 2,2 | 5,4 | 3,1 | 2,7 | - | ✓ | ✓ | - | - | | | |
| L 76 x 76 x 6.4 | 7,3 | 76,2 | 6,35 | 9,3 | 0,301 | 41,23 | 2,1 | 5,4 | 3,0 | 2,7 | - | ✓ | ✓ | - | - | | | |
| L 51 x 51 x 6.4 | 4,7 | 50,8 | 6,35 | 6,1 | 0,198 | 42,13 | 1,5 | 3,6 | 2,1 | 1,8 | - | ✓ | ✓ | - | - | | | |
| L 51 x 51 x 4.8 | 3,6 | 50,8 | 4,76 | 4,6 | 0,199 | 55,28 | 1,4 | 3,6 | 2,0 | 1,8 | - | ✓ | ✓ | - | - | | | |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | Classification ANSI/AISC 360-16 | |
|---|---|---------------------|-------------|-------------------------------|-------|-------------------------------|-------|-----------------|-------------|------------------------------------|-----|
| | axis y-y / axis z-z eje y-y / eje z-z oś y-y / oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | I_{yz} | Compression | | |
| | $I_y = I_z$ | $W_{ely} = W_{edz}$ | $i_y = i_z$ | I_u | i_u | I_v | i_v | | grade 50 | grade 65 | |
| G lb/ft | cm ⁴ | cm ³ | cm | cm ⁴ | cm | cm ⁴ | cm | cm ⁴ | | | |
| L 5 x 5 x 5/8 | 20 | 564,2 | 63,00 | 3,86 | 894,9 | 4,86 | 233,5 | 2,48 | -330,7 | nsl | nsl |
| L 5 x 5 x 1/2 | 16,2 | 466,0 | 51,36 | 3,90 | 741,3 | 4,91 | 190,7 | 2,49 | -275,3 | nsl | nsl |
| L 5 x 5 x 7/16 | 14,3 | 414,2 | 45,32 | 3,91 | 659,3 | 4,93 | 169,1 | 2,50 | -245,1 | nsl | nsl |
| L 5 x 5 x 3/8 | 12,3 | 363,4 | 39,59 | 3,95 | 579,6 | 4,99 | 147,2 | 2,51 | -216,2 | nsl | nsl |
| L 5 x 5 x 5/16 | 10,3 | 308,3 | 33,37 | 3,97 | 492,1 | 5,02 | 124,5 | 2,52 | -183,8 | nsl | nsl |
| L 4 x 4 x 7/16 | 11,3 | 206,5 | 28,61 | 3,11 | 328,3 | 3,92 | 84,70 | 1,99 | -121,8 | nsl | nsl |
| L 4 x 4 x 3/8 | 9,8 | 180,0 | 24,68 | 3,12 | 286,3 | 3,93 | 73,70 | 1,99 | -106,3 | nsl | nsl |
| L 4 x 4 x 5/16 | 8,2 | 154,0 | 20,99 | 3,15 | 245,5 | 3,98 | 62,54 | 2,01 | -91,46 | nsl | nsl |
| L 3 1/2 x 3 1/2 x 3/8 | 8,5 | 118,8 | 18,78 | 2,72 | 188,9 | 3,43 | 48,71 | 1,74 | -70,09 | nsl | nsl |
| L 3 1/2 x 3 1/2 x 5/16 | 7,2 | 100,5 | 15,68 | 2,72 | 159,8 | 3,43 | 41,21 | 1,74 | -59,29 | nsl | nsl |
| L 3 1/2 x 3 1/2 x 1/4 | 5,8 | 82,51 | 12,76 | 2,74 | 131,3 | 3,46 | 33,72 | 1,75 | -48,79 | nsl | nsl |
| L 3 x 3 x 3/8 | 7,2 | 72,92 | 13,57 | 2,31 | 115,7 | 2,91 | 30,15 | 1,49 | -42,77 | nsl | nsl |
| L 3 x 3 x 5/16 | 6,1 | 61,99 | 11,38 | 2,32 | 98,50 | 2,92 | 25,48 | 1,49 | -36,51 | nsl | nsl |
| L 3 x 3 x 1/4 | 4,9 | 51,46 | 9,370 | 2,35 | 81,95 | 2,97 | 20,97 | 1,50 | -30,49 | nsl | nsl |
| L 2 x 2 x 1/4 | 3,19 | 14,04 | 3,900 | 1,53 | 22,30 | 1,93 | 5,78 | 0,98 | -8,260 | nsl | nsl |
| L 2 x 2 x 3/16 | 2,44 | 11,19 | 3,060 | 1,55 | 17,79 | 1,96 | 4,59 | 0,99 | -6,600 | nsl | nsl |

c = compact; nc = non compact; s = slender; nsl = non slender

American unequal leg angles

Dimensions: ASTM A 6/A 6M

Tolerances: ASTM A 6/A 6M

Surface condition: according to ASTM A 6/A 6M

Perfiles americanos angulares de lados desiguales

Dimensiones: ASTM A 6/A 6M

Tolerancias: ASTM A 6/A 6M

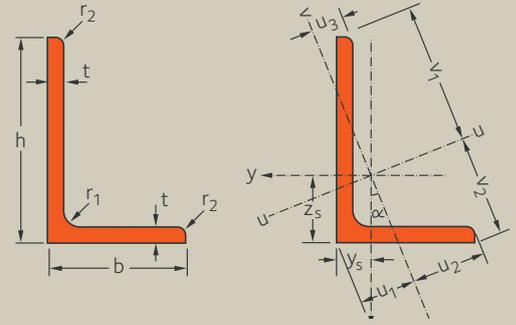
Condición de superficie: según ASTM A 6/A 6M

Amerykańskie kątowniki nierównoramienne

Wymiary: ASTM A 6/A 6M

Tolerancje: ASTM A 6/A 6M

Stan powierzchni: według ASTM A 6/A 6M



| Designation Denominación Oznaczenie (metric) | Dimensions Dimensiones Wymiary | | | Surface Superficie Powierzchni | | | Position of axes Posición de los ejes Polożenie osi | | | | | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|------|-----|--------------------------------------|-------------------|-------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|---|---------------------|-----------------|------------------|----------|----------------|---|
| | G | h | b | t | A | A _L | A _G | Z _s | y _s | v ₁ | v ₂ | u ₁ | u ₂ | u ₃ | A709 - Grade 50/50S | A992 - Grade 50 | A572 Grade 50 | Grade 65 | A588 - Grade B | |
| kg/m | mm | mm | mm | cm ² | m ² /m | m ² /t | mm | mm | mm | mm | mm | mm | mm | mm | ✓ | ✓ | ✓ | ✓ | ✓ | |
| L 203 x 102 x 15.9 | 40 | 36 | 203 | 102 | 15,9 | 45,9 | 0,597 | 16,46 | 7,3 | 2,3 | 13,2 | 9,1 | 4,1 | 5,9 | 2,4 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 102 x 14.3 | 40 | 32,4 | 203 | 102 | 14,3 | 41,5 | 0,597 | 18,19 | 7,2 | 2,2 | 13,2 | 9,0 | 4,0 | 6,0 | 2,3 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 102 x 12.7 | 40 | 29 | 203 | 102 | 12,7 | 37,1 | 0,597 | 20,36 | 7,2 | 2,2 | 13,3 | 9,0 | 3,9 | 6,0 | 2,2 | ✓ | ✓ | ✓ | ✓ | ✓ |
| L 203 x 102 x 11.1 | 40 | 25,6 | 203 | 102 | 11,1 | 32,6 | 0,597 | 23,15 | 7,1 | 2,1 | 13,3 | 8,9 | 3,9 | 6,0 | 2,2 | ✓ | ✓ | ✓ | ✓ | ✓ |



Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosiniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie (imperial) | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification ANSI/AISC 360-16 | |
|---|---|-----------------|-------|-------------------------------|-----------------|-------|-------------------------------|-------|-------------------------------|-------|-----------------|----------|------------------------------------|----------|
| | axis y-y eje y-y oś y-y | | | axis z-z eje z-z oś z-z | | | axis u-u eje u-u oś u-u | | axis v-v eje v-v oś v-v | | I_{yz} | α | Compression | |
| | I_y | W_{ely} | i_y | I_z | W_{elz} | i_z | I_u | i_u | I_v | i_v | | | grade 50 | grade 65 |
| G lb/ft | cm ⁴ | cm ³ | cm | cm ⁴ | cm ³ | cm | cm ⁴ | cm | cm ⁴ | cm | cm ⁴ | o | | |

| | | | | | | | | | | | | | | | |
|----------------|------|------|-------|------|-------|-------|------|------|------|-------|------|--------|------|-----|-----|
| L 8 x 4 x 5/8 | 24,2 | 1943 | 149,3 | 6,48 | 334,2 | 42,26 | 2,69 | 2061 | 6,68 | 215,8 | 2,16 | -452,2 | 14,7 | nsl | nsl |
| L 8 x 4 x 9/16 | 21,9 | 1769 | 135,2 | 6,50 | 305,8 | 38,36 | 2,70 | 1878 | 6,70 | 196,6 | 2,17 | -414,4 | 14,8 | nsl | nsl |
| L 8 x 4 x 1/2 | 19,6 | 1590 | 120,9 | 6,52 | 276,3 | 34,38 | 2,72 | 1690 | 6,72 | 177,0 | 2,18 | -374,7 | 14,9 | nsl | nsl |
| L 8 x 4 x 7/16 | 17,2 | 1407 | 106,4 | 6,54 | 245,6 | 30,31 | 2,73 | 1496 | 6,75 | 156,9 | 2,18 | -333,0 | 14,9 | nsl | nsl |

c = compact; nc = non compact; s = slender; nsl = non slender

WTM plates (Web Tailor-Made)

Dimensions: ArcelorMittal standard

Tolerances: ArcelorMittal standard

Surface condition: ASTM A 6/A 6M

Chapas WTM (con ancho a medida)

Dimensiones: ArcelorMittal standard

Tolerancias: ArcelorMittal standard

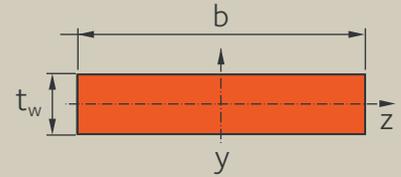
Condición de superficie: ASTM A 6/A 6M

Środnik dostosowany do kształtu WTM

Wymiary: ArcelorMittal standard

Tolerancje: ArcelorMittal standard

Stan powierzchni: ASTM A 6/A 6M



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | Surface Superficie Powierzchnia | Section properties Propiedades del perfil Właściwości profilu | | Steel grades Calidades de acero Gatunki stali | | | |
|---|--------------------------------------|-------------|---------------------------------------|---|--------------------------|--|----------|---|---|
| | | | | I_y cm ⁴ | I_z cm ⁴ | A913 | | | |
| G kg/m lb/ft | b mm | t_w mm | A cm ² | | | Grade 50 | Grade 65 | | |
| WTM 1016 x 810 | WTM 40 x 544 | ☎ 810 544 | 1016,0 | 101,6 | 1 032,3 | 888 000 | 8880 | ✓ | ✓ |
| WTM 1016 x 709 | WTM 40 x 476 | ☎ 709 476 | 1016,0 | 88,9 | 903,2 | 777 000 | 5949 | ✓ | ✓ |
| WTM 1016 x 608 | WTM 40 x 408 | ☎ 608 408 | 1016,0 | 76,2 | 774,2 | 666 000 | 3746 | ✓ | ✓ |
| WTM 1016 x 557 | WTM 40 x 374 | ☎ 557 374 | 1016,0 | 69,9 | 709,7 | 610 500 | 2885 | ✓ | ✓ |
| WTM 1016 x 506 | WTM 40 x 340 | ☎ 506 340 | 1016,0 | 63,5 | 645,2 | 555 000 | 2168 | ✓ | ✓ |
| WTM 915 x 729 | WTM 36 x 490 | ☎ 729 490 | 914,4 | 101,6 | 929,0 | 647 300 | 7992 | ✓ | ✓ |
| WTM 915 x 638 | WTM 36 x 429 | ☎ 638 429 | 914,4 | 88,9 | 812,9 | 566 400 | 5354 | ✓ | ✓ |
| WTM 915 x 547 | WTM 36 x 368 | ☎ 547 368 | 914,4 | 76,2 | 696,8 | 485 500 | 3371 | ✓ | ✓ |
| WTM 915 x 501 | WTM 36 x 337 | ☎ 501 337 | 914,4 | 69,9 | 638,7 | 445 000 | 2597 | ✓ | ✓ |
| WTM 915 x 456 | WTM 36 x 306 | ☎ 456 306 | 914,4 | 63,5 | 580,6 | 404 600 | 1951 | ✓ | ✓ |
| WTM 810 x 648 | WTM 32 x 436 | ☎ 648 436 | 812,8 | 101,6 | 825,8 | 454 600 | 7104 | ✓ | ✓ |
| WTM 810 x 567 | WTM 32 x 381 | ☎ 567 381 | 812,8 | 88,9 | 722,6 | 397 800 | 4759 | ✓ | ✓ |
| WTM 810 x 486 | WTM 32 x 327 | ☎ 486 327 | 812,8 | 76,2 | 619,4 | 341 000 | 2997 | ✓ | ✓ |
| WTM 810 x 446 | WTM 32 x 299 | ☎ 446 299 | 812,8 | 69,9 | 567,7 | 312 600 | 2308 | ✓ | ✓ |
| WTM 810 x 405 | WTM 32 x 272 | ☎ 405 272 | 812,8 | 63,5 | 516,1 | 284 100 | 1734 | ✓ | ✓ |
| WTM 710 x 567 | WTM 28 x 381 | ☎ 567 381 | 711,2 | 101,6 | 722,6 | 304 600 | 6216 | ✓ | ✓ |
| WTM 710 x 496 | WTM 28 x 333 | ☎ 496 333 | 711,2 | 88,9 | 632,3 | 266 500 | 4164 | ✓ | ✓ |
| WTM 710 x 425 | WTM 28 x 286 | ☎ 425 286 | 711,2 | 76,2 | 541,9 | 228 400 | 2622 | ✓ | ✓ |
| WTM 710 x 390 | WTM 28 x 262 | ☎ 390 262 | 711,2 | 69,9 | 496,8 | 209 400 | 2020 | ✓ | ✓ |
| WTM 710 x 355 | WTM 28 x 238 | ☎ 355 238 | 711,2 | 63,5 | 451,6 | 190 400 | 1518 | ✓ | ✓ |
| WTM 610 x 486 | WTM 24 x 327 | ☎ 486 327 | 609,6 | 101,6 | 619,4 | 191 800 | 5328 | ✓ | ✓ |
| WTM 610 x 425 | WTM 24 x 286 | ☎ 425 286 | 609,6 | 88,9 | 541,9 | 167 800 | 3569 | ✓ | ✓ |
| WTM 610 x 365 | WTM 24 x 245 | ☎ 365 245 | 609,6 | 76,2 | 464,5 | 143 800 | 2248 | ✓ | ✓ |
| WTM 610 x 334 | WTM 24 x 225 | ☎ 334 225 | 609,6 | 69,9 | 425,8 | 131 900 | 1731 | ✓ | ✓ |
| WTM 610 x 304 | WTM 24 x 204 | ☎ 304 204 | 609,6 | 63,5 | 387,1 | 119 900 | 1301 | ✓ | ✓ |

150 North Riverside,
Chicago, United States



Architect: Goettsch Partners. © TomRositterPhotography

Lakhta Center,
Saint Petersburg, Russia



Russian Sections

Perfiles rusos

Kształtowniki rosyjskie

148 Russian hot rolled beams

148 Perfiles rusos laminados en caliente

148 Rosyjskie kształtowniki gorqcowalcowane

150 Channels with taper flanges

150 Perfiles U de alas inclinadas

150 Ceowniki o stopkach stożkowych

Russian hot rolled beams

Dimensions: STO ASCHM 20-93; For $G \leq G^{1882}$ dimensions according to GOST 26020-83

Tolerances: STO ASCHM 20-93; For $G \leq G^{1882}$ tolerances according to GOST 26020-83

Surface condition: according to EN 10163-3: 2004, class c, subclass 1

Perfiles rusos laminados en caliente

Dimensiones: STO ASCHM 20-93; Para $G \leq G^{1882}$ dimensiones según GOST 26020-83

Tolerancias: STO ASCHM 20-93; Para tolerancias $G < G^{1882}$ según GOST 26020-83

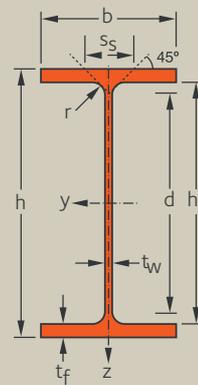
Condición de superficie: según EN 10163-3: 2004, clase c, subclase 1

Rosyjskie kształtowniki gorzcowalcowane

Wymiary: STO ASCHM 20-93; Dla $G < G^{1882}$ wymiary wg. GOST 26020-83

Tolerancje: STO ASCHM 20-93; Dla $G < G^{1882}$ tolerancje wg. GOST 26020-83

Jakość powierzchni: wg. EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | | |
|---|--------------------------------------|---------|---------|----------------------|----------------------|---------|----------------------|---------------------------------------|----------------------|-------------------------------------|---|-----------------|-------------|---|---------|---------------|---------|-------|
| | G kg/m | h mm | b mm | t _w mm | t _f mm | r mm | h _i mm | d mm | A cm ² | A _L m ² /m | A _G m ² /t | C255-C355/09G2* | JR/J0/J2/K2 | M | AISI304 | MO/MIL0/MIL10 | S 460 M | 16Mo3 |
| 40K5 | 290,8 | 429,0 | 400,0 | 23,0 | 35,5 | 22 | 358,0 | 314,0 | 370,49 | 2,374 | 8,160 | - | ✓ | ✓ | ✓ | ✓ | - | ✓ |
| 40K4 | 231,9 | 414,0 | 405,0 | 18,0 | 28,0 | 22 | 358,0 | 314,0 | 295,39 | 2,374 | 10,24 | - | ✓ | ✓ | ✓ | ✓ | - | ✓ |
| 40K3 | 200,1 | 406,0 | 403,0 | 16,0 | 24,0 | 22 | 358,0 | 314,0 | 254,87 | 2,354 | 11,77 | - | ✓ | ✓ | ✓ | ✓ | - | ✓ |
| 40K2 | 171,7 | 400,0 | 400,0 | 13,0 | 21,0 | 22 | 358,0 | 314,0 | 218,69 | 2,336 | 13,61 | - | ✓ | ✓ | ✓ | ✓ | - | ✓ |
| 40K1 | 146,6 | 394,0 | 398,0 | 11,0 | 18,0 | 22 | 358,0 | 314,0 | 186,81 | 2,320 | 15,82 | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 30K3 | 105,8 | 300,0 | 305,0 | 15,0 | 15,0 | 18 | 270,0 | 234,0 | 134,78 | 1,759 | 16,63 | ✓ | - | - | - | - | - | - |
| 30K2 | 94 | 300,0 | 300,0 | 10,0 | 15,0 | 18 | 270,0 | 234,0 | 119,78 | 1,749 | 18,60 | ✓ | - | - | - | - | - | - |
| 30K1 | 87 | 298,0 | 299,0 | 9,0 | 14,0 | 18 | 270,0 | 234,0 | 110,80 | 1,743 | 20,04 | ✓ | - | - | - | - | - | - |
| 25K2 | 72,4 | 250,0 | 250,0 | 9,0 | 14,0 | 16 | 222,0 | 190,0 | 92,18 | 1,455 | 20,10 | ✓ | - | - | - | - | - | - |
| 25K1 | 62,6 | 246,0 | 249,0 | 8,0 | 12,0 | 16 | 222,0 | 190,0 | 79,72 | 1,445 | 23,08 | ✓ | - | - | - | - | - | - |
| 20K2 | 49,9 | 200,0 | 200,0 | 8,0 | 12,0 | 13 | 176,0 | 150,0 | 63,53 | 1,162 | 23,29 | ✓ | - | - | - | - | - | - |
| 20K1 | 41,4 | 196,0 | 199,0 | 6,5 | 10,0 | 13 | 176,0 | 150,0 | 52,69 | 1,153 | 27,87 | ✓ | - | - | - | - | - | - |
| 30SZ2 | 68,6 | 300,0 | 201,0 | 9,0 | 15,0 | 18 | 270,0 | 234,0 | 87,38 | 1,355 | 19,76 | ✓ | - | - | - | - | - | - |
| 30SZ1 | 56,8 | 294,0 | 200,0 | 8,0 | 12,0 | 18 | 270,0 | 234,0 | 72,38 | 1,341 | 23,60 | ✓ | - | - | - | - | - | - |
| 20SZ1 | 39,01 | 194,0 | 150,0 | 6,0 | 9,0 | 13 | 176,0 | 150,0 | 30,60 | 0,954 | 39,70 | ✓ | - | - | - | - | - | - |
| 50B3 | 89,7 | 500,0 | 200,0 | 10,0 | 16,0 | 20 | 468,0 | 428,0 | 114,23 | 1,746 | 19,47 | ✓ | - | - | - | - | - | - |
| 50B2 | 79,5 | 496,0 | 199,0 | 9,0 | 14,0 | 20 | 468,0 | 428,0 | 101,27 | 1,736 | 21,83 | ✓ | - | - | - | - | - | - |
| 50B1 | 72,5 | 492,0 | 199,0 | 8,8 | 12,0 | 20 | 468,0 | 428,0 | 92,38 | 1,728 | 23,83 | ✓ | - | - | - | - | - | - |
| 45B2 | 76 | 450,0 | 200,0 | 9,0 | 14,0 | 18 | 422,0 | 386,0 | 96,76 | 1,651 | 21,74 | ✓ | - | - | - | - | - | - |
| 45B1 | 66,2 | 446,0 | 199,0 | 8,0 | 12,0 | 18 | 422,0 | 386,0 | 84,30 | 1,641 | 24,80 | ✓ | - | - | - | - | - | - |
| 40B2 | 66 | 400,0 | 200,0 | 8,0 | 13,0 | 16 | 374,0 | 342,0 | 84,12 | 1,557 | 23,57 | ✓ | - | - | - | - | - | - |
| 40B1 | 56,6 | 396,0 | 199,0 | 7,0 | 11,0 | 16 | 374,0 | 342,0 | 72,16 | 1,547 | 27,30 | ✓ | - | - | - | - | - | - |
| 35B2 | 49,6 | 350,0 | 175,0 | 7,0 | 11,0 | 14 | 328,0 | 300,0 | 63,14 | 1,362 | 27,48 | ✓ | - | - | - | - | - | - |
| 35B1 | 41,4 | 346,0 | 174,0 | 6,0 | 9,0 | 14 | 328,0 | 300,0 | 52,68 | 1,352 | 32,69 | ✓ | - | - | - | - | - | - |
| 30B2 | 36,7 | 300,0 | 150,0 | 6,5 | 9,0 | 13 | 282,0 | 256,0 | 46,78 | 1,165 | 31,72 | ✓ | - | - | - | - | - | - |
| 30B1 | 32 | 298,0 | 149,0 | 5,5 | 8,0 | 13 | 282,0 | 256,0 | 40,80 | 1,159 | 36,18 | ✓ | - | - | - | - | - | - |
| 25B2 | 29,6 | 250,0 | 125,0 | 6,0 | 9,0 | 12 | 232,0 | 208,0 | 37,66 | 0,967 | 32,73 | ✓ | - | - | - | - | - | - |
| 25B1 | 25,7 | 248,0 | 124,0 | 5,0 | 8,0 | 12 | 232,0 | 208,0 | 32,68 | 0,961 | 37,48 | ✓ | - | - | - | - | - | - |
| 20B1 | 21,3 | 200,0 | 100,0 | 5,5 | 8,0 | 11 | 184,0 | 162,0 | 27,16 | 0,770 | 36,12 | ✓ | - | - | - | - | - | - |
| 18B2 | 18,8 | 180,0 | 91,0 | 5,3 | 8,0 | 9 | 164,0 | 146,0 | 23,95 | 0,698 | 37,13 | ✓ | - | - | - | - | - | - |
| 18B1 | 15,4 | 177,0 | 91,0 | 4,3 | 6,5 | 9 | 164,0 | 146,0 | 19,58 | 0,694 | 45,15 | ✓ | - | - | - | - | - | - |
| 16B2 | 15,8 | 160,0 | 82,0 | 5,0 | 7,4 | 9 | 145,2 | 127,2 | 20,09 | 0,623 | 39,47 | ✓ | - | - | - | - | - | - |
| 16B1 | 12,7 | 157,0 | 82,0 | 4,0 | 5,9 | 9 | 145,2 | 127,2 | 16,18 | 0,619 | 48,70 | ✓ | - | - | - | - | - | - |
| 14B2 | 12,9 | 140,0 | 73,0 | 4,7 | 6,9 | 7 | 126,2 | 112,2 | 16,43 | 0,551 | 42,70 | ✓ | - | - | - | - | - | - |
| 14B1 | 10,5 | 137,4 | 73,0 | 3,8 | 5,6 | 7 | 126,2 | 112,2 | 13,39 | 0,547 | 52,05 | ✓ | - | - | - | - | - | - |
| 12B2 | 10,4 | 120,0 | 64,0 | 4,4 | 6,3 | 7 | 107,4 | 93,4 | 13,21 | 0,475 | 45,82 | ✓ | - | - | - | - | - | - |
| 12B1 | 8,7 | 117,6 | 64,0 | 3,8 | 5,1 | 7 | 107,4 | 93,4 | 11,03 | 0,472 | 54,47 | ✓ | - | - | - | - | - | - |
| 10B1 | 8,1 | 100,0 | 55,0 | 4,1 | 5,7 | 7 | 88,6 | 74,6 | 10,32 | 0,400 | 49,33 | ✓ | - | - | - | - | - | - |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odnosniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | Classification EN 1993-1-1 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | |
|---|---|-----------------|-----------------|-------|-----------------|-----------------|---|-----------------|-------|-------|-----------------|-----------------|-------------------------------|--|---------------------|--|---|----------------------|----------------------|----------------------|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | Pure bending yy | | Pure compression | | Contour encasement | | Hollow encasement | |
| | I_y | W_{ely} | W_{ply} | i_y | A_{vz} | I_z | W_{elz} | W_{plz} | i_z | S_s | I_t | I_w | | | | | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten |
| kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|------|-------|--------|-------|-------|------|-------|-------|-------|-------|------|------|-------|-------|---|---|---|---|-----|-----|-----|-----|
| 40K5 | 290,8 | 120290 | 5608 | 6397 | 18,0 | 110,3 | 37914 | 1896 | 2894 | 10,1 | 12,0 | 1416 | 14677 | 1 | 1 | 1 | 1 | 53 | 64 | 34 | 45 |
| 40K4 | 231,9 | 92771 | 4482 | 5026 | 17,7 | 86,00 | 31026 | 1532 | 2331 | 10,2 | 10,0 | 713,9 | 11557 | 1 | 1 | 1 | 1 | 67 | 80 | 42 | 55 |
| 40K3 | 200,1 | 78039 | 3844 | 4280 | 17,5 | 75,80 | 26200 | 1300 | 1977 | 10,1 | 9,0 | 461,7 | 9558 | 1 | 2 | 1 | 2 | 77 | 92 | 48 | 63 |
| 40K2 | 171,7 | 66621 | 3331 | 3672 | 17,5 | 62,70 | 22412 | 1121 | 1700 | 10,1 | 8,1 | 303,4 | 8048 | 3 | 3 | 3 | 3 | 89 | 107 | 55 | 73 |
| 40K1 | 146,6 | 56145 | 2850 | 3118 | 17,3 | 53,40 | 18922 | 950,9 | 1441 | 10,1 | 7,3 | 193,9 | 6688 | 3 | 3 | 3 | 3 | 103 | 124 | 63 | 85 |
| 30K3 | 105,8 | 21535 | 1436 | 1614 | 12,6 | 50,90 | 7105 | 465,9 | 716,1 | 7,3 | 6,6 | 116,4 | 1443 | 3 | 3 | 3 | 3 | 108 | 131 | 67 | 90 |
| 30K2 | 94 | 20410 | 1361 | 1501 | 13,1 | 36,70 | 6755 | 450,3 | 684,3 | 7,5 | 6,1 | 88,14 | 1372 | 3 | - | 3 | - | 121 | 146 | 75 | 100 |
| 30K1 | 87 | 18848 | 1265 | 1389 | 13,0 | 33,40 | 6241 | 417,5 | 633,6 | 7,5 | 5,8 | 71,33 | 1258 | 3 | - | 3 | - | 130 | 157 | 81 | 108 |
| 25K2 | 72,4 | 10832 | 866,6 | 960,5 | 10,8 | 27,90 | 3649 | 291,9 | 443,8 | 6,3 | 5,6 | 58,74 | 508,1 | 2 | - | 2 | - | 131 | 158 | 81 | 108 |
| 25K1 | 62,6 | 9171 | 745,6 | 821,4 | 10,7 | 24,80 | 3090 | 248,2 | 377,2 | 6,2 | 5,1 | 38,59 | 423,0 | 3 | - | 3 | - | 150 | 181 | 93 | 124 |
| 20K2 | 49,9 | 4716 | 471,6 | 525,5 | 8,6 | 19,60 | 1602 | 160,2 | 243,8 | 5,0 | 4,7 | 29,81 | 141,5 | 1 | - | 1 | - | 151 | 183 | 94 | 126 |
| 20K1 | 41,4 | 3846 | 392,5 | 432,8 | 8,5 | 16,10 | 1314 | 132,1 | 200,8 | 5,0 | 4,2 | 17,59 | 113,7 | 3 | - | 3 | - | 181 | 219 | 112 | 150 |

| | | | | | | | | | | | | | | | | | | | | | |
|------|-------|-------|-------|-------|------|-------|-------|-------|-------|-----|-----|-------|-------|---|---|---|---|-----|-----|-----|-----|
| 30Ш2 | 68,6 | 14209 | 947,3 | 1060 | 12,8 | 33,80 | 2034 | 202,4 | 310,8 | 4,8 | 6,0 | 62,36 | 413,1 | 3 | - | 3 | - | 132 | 155 | 92 | 115 |
| 30Ш1 | 56,8 | 11338 | 771,3 | 859,0 | 12,5 | 29,70 | 1603 | 160,3 | 246,6 | 4,7 | 5,3 | 35,79 | 318,7 | 3 | - | 3 | - | 158 | 185 | 109 | 137 |
| 20Ш1 | 39,01 | 2690 | 277,3 | 308,6 | 8,3 | 14,90 | 507,2 | 67,62 | 103,7 | 3,6 | 3,9 | 10,90 | 43,39 | 1 | - | 1 | - | 206 | 244 | 138 | 176 |

| | | | | | | | | | | | | | | | | | | | | | |
|------|------|-------|-------|-------|------|-------|-------|-------|-------|-----|-----|-------|-------|---|---|---|---|-----|-----|-----|-----|
| 50Б3 | 89,7 | 47846 | 1914 | 2175 | 20,5 | 58,20 | 2141 | 214,1 | 335,0 | 4,3 | 6,5 | 85,88 | 1254 | 1 | - | 4 | - | 135 | 153 | 105 | 123 |
| 50Б2 | 79,5 | 41869 | 1688 | 1914 | 20,3 | 52,40 | 1845 | 185,4 | 289,8 | 4,3 | 6,0 | 60,79 | 1072 | 1 | - | 4 | - | 152 | 171 | 118 | 137 |
| 50Б1 | 72,5 | 36841 | 1498 | 1707 | 20,0 | 50,50 | 1582 | 159,0 | 249,7 | 4,1 | 5,6 | 44,82 | 911,2 | 1 | - | 4 | - | 166 | 187 | 128 | 150 |
| 45Б2 | 76 | 33450 | 1487 | 1679 | 18,6 | 47,10 | 1872 | 187,2 | 290,9 | 4,4 | 5,8 | 56,91 | 889,4 | 1 | - | 4 | - | 150 | 171 | 114 | 134 |
| 45Б1 | 66,2 | 28697 | 1287 | 1450 | 18,5 | 41,80 | 1580 | 158,8 | 246,6 | 4,3 | 5,3 | 38,27 | 744,0 | 1 | - | 4 | - | 171 | 195 | 129 | 153 |
| 40Б2 | 66 | 23704 | 1185 | 1326 | 16,8 | 37,30 | 1736 | 173,6 | 267,6 | 4,5 | 5,3 | 42,16 | 650,1 | 1 | - | 4 | - | 161 | 185 | 119 | 143 |
| 40Б1 | 56,6 | 20018 | 1011 | 1128 | 16,7 | 32,70 | 1447 | 145,4 | 223,9 | 4,5 | 4,8 | 27,08 | 536,3 | 1 | - | 4 | - | 187 | 214 | 137 | 165 |
| 35Б2 | 49,6 | 13559 | 774,8 | 867,9 | 14,7 | 28,50 | 984,3 | 112,5 | 173,6 | 3,9 | 4,5 | 22,99 | 282,8 | 1 | - | 4 | - | 188 | 216 | 139 | 166 |
| 35Б1 | 41,4 | 11094 | 641,3 | 716,2 | 14,5 | 24,40 | 791,5 | 90,98 | 140,2 | 3,9 | 4,0 | 13,64 | 224,7 | 2 | - | 4 | - | 224 | 257 | 164 | 197 |
| 30Б2 | 36,7 | 7209 | 480,6 | 542,1 | 12,4 | 22,70 | 507,5 | 67,67 | 105,1 | 3,3 | 4,0 | 12,37 | 107,4 | 1 | - | 4 | - | 217 | 249 | 160 | 192 |
| 30Б1 | 32 | 6318 | 424,0 | 475,1 | 12,4 | 19,50 | 442,0 | 59,33 | 91,76 | 3,3 | 3,7 | 8,654 | 92,93 | 2 | - | 4 | - | 247 | 284 | 183 | 219 |
| 25Б2 | 29,6 | 4052 | 324,1 | 365,9 | 10,4 | 17,90 | 293,8 | 47,02 | 73,10 | 2,8 | 3,8 | 9,680 | 42,67 | 1 | - | 4 | - | 224 | 257 | 166 | 199 |
| 25Б1 | 25,7 | 3537 | 285,3 | 319,4 | 10,4 | 15,20 | 254,9 | 41,11 | 63,59 | 2,8 | 3,5 | 6,736 | 36,70 | 1 | - | 4 | - | 256 | 294 | 190 | 228 |
| 20Б1 | 21,3 | 1844 | 184,4 | 209,5 | 8,2 | 13,40 | 133,9 | 26,78 | 41,93 | 2,2 | 3,4 | 5,766 | 12,34 | 1 | - | 2 | - | 247 | 284 | 184 | 221 |
| 18Б2 | 18,8 | 1317 | 146,3 | 166,4 | 7,4 | 11,30 | 100,9 | 22,16 | 34,60 | 2,1 | 3,2 | 4,726 | 7,458 | 1 | - | 2 | - | 253 | 291 | 188 | 226 |
| 18Б1 | 15,4 | 1063 | 120,1 | 135,3 | 7,4 | 9,200 | 81,89 | 18,00 | 27,96 | 2,0 | 2,8 | 2,673 | 5,951 | 1 | - | 3 | - | 308 | 354 | 227 | 274 |
| 16Б2 | 15,8 | 869,3 | 108,7 | 123,9 | 6,6 | 9,660 | 68,31 | 16,66 | 26,10 | 1,8 | 3,0 | 3,541 | 3,977 | 1 | - | 1 | - | 269 | 310 | 200 | 241 |
| 16Б1 | 12,7 | 689,3 | 87,81 | 99,09 | 6,5 | 7,800 | 54,43 | 13,27 | 20,70 | 1,8 | 2,6 | 1,934 | 3,106 | 1 | - | 3 | - | 332 | 382 | 245 | 295 |
| 14Б2 | 12,9 | 541,2 | 77,32 | 88,34 | 5,7 | 7,640 | 44,92 | 12,31 | 19,25 | 1,7 | 2,7 | 2,399 | 1,989 | 1 | - | 1 | - | 291 | 335 | 215 | 259 |
| 14Б1 | 10,5 | 434,9 | 63,30 | 71,60 | 5,7 | 6,210 | 36,42 | 9,979 | 15,52 | 1,6 | 2,3 | 1,338 | 1,581 | 1 | - | 2 | - | 354 | 409 | 260 | 314 |
| 12Б2 | 10,4 | 317,8 | 52,96 | 60,73 | 4,9 | 6,310 | 27,67 | 8,646 | 13,58 | 1,4 | 2,5 | 1,690 | 0,894 | 1 | - | 1 | - | 311 | 360 | 230 | 279 |
| 12Б1 | 8,7 | 257,4 | 43,77 | 49,87 | 4,8 | 5,410 | 22,39 | 6,996 | 10,98 | 1,4 | 2,2 | 0,996 | 0,708 | 1 | - | 1 | - | 370 | 428 | 271 | 329 |
| 10Б1 | 8,1 | 171,0 | 34,20 | 39,41 | 4,1 | 5,080 | 15,92 | 5,788 | 9,145 | 1,2 | 2,4 | 1,157 | 0,353 | 1 | - | 1 | - | 334 | 387 | 247 | 300 |

Channels with taper flanges

Dimensions: GOST 8 240-97, PN-H-93 451:2007

Tolerances: GOST 8 240-97, EN 10279:2000

Surface condition: according to EN 10163-3:2004, class C, subclass 1

Perfiles U de alas inclinadas

Dimensiones: GOST 8 240-97, PN-H-93 451:2007

Tolerancias: GOST 8 240-97, EN 10279:2000

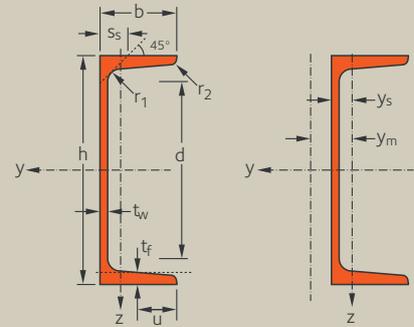
Condición de superficie: según EN 10163-3:2004, clase C, subclase 1

Ceowniki o stopkach stożkowych

Wymiary: GOST 8 240-97, PN-H-93 451:2007

Tolerancje: GOST 8 240-97, EN 10279:2000

Stan powierzchni: zgodnie z EN 10163-3:2004, klasa C, podklasa 1



| Designation Denominación Oznaczenie | Dimensions Dimensiones Wymiary | | | | | | | Surface Superficie Powierzchnia | | | Steel grades Calidades de acero Gatunki stali | | | | | | |
|---|--------------------------------------|-----|----|----------------|----------------|-----|----------------|---------------------------------------|-------------------|-------------------|---|-----------------|------|-------------|---|----------|---------------|
| | G | h | b | t _w | t _f | r | r ₂ | d | A | A _L | A _G | C255-C355/09G25 | S355 | JR/J0/J2/K2 | M | Arcorox® | MO/MILC/MILTO |
| kg/m | mm | mm | mm | mm | mm | mm | mm | cm ² | m ² /m | m ² /t | ✓ | | | | | | |
| UE 200 | 18,4 | 200 | 76 | 5,2 | 9 | 9,5 | 4 | 159 | 23,4 | 0,681 | 37,51 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UE 180 | 16,3 | 180 | 70 | 5,1 | 8,7 | 9 | 3,5 | 141 | 20,7 | 0,617 | 38,46 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UE 160 | 14,2 | 160 | 64 | 5 | 8,4 | 8,5 | 3,5 | 123 | 18,1 | 0,555 | 39,51 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UE 140 | 12,3 | 140 | 58 | 4,9 | 8,1 | 8 | 3 | 105 | 15,6 | 0,492 | 40,55 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UE 120 | 10,4 | 120 | 52 | 4,8 | 7,8 | 7,5 | 3 | 87,2 | 13,3 | 0,429 | 41,71 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UE 100 | 8,59 | 100 | 46 | 4,5 | 7,6 | 7 | 3 | 68,9 | 10,9 | 0,367 | 43,29 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UE 80 | 7,05 | 80 | 40 | 4,5 | 7,4 | 6,5 | 2,5 | 50,7 | 8,98 | 0,304 | 43,70 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Notations pages 166-168 / Páginas de anotaciones 166-168 / Odkazniki do symbolów na stronach 166-168

| Designation Denominación Oznaczenie | Section properties / Propiedades del perfil / Właściwości profilu | | | | | | | | | | | | | | | Classification EN 1993-1-1 | | | | Sections factors/ factores de perfil/ Wskaźniki przekroju Ap/V [m ⁻¹] | | | |
|---|---|------------------|------------------|----------------|-----------------|---|------------------|------------------|----------------|----------------|-----------------|-------------------------------------|----------------|----------------|-----|-------------------------------|---|---------------------|----------------------|---|----------------------|----------------------|-----|
| | strong axis y-y eje fuerte y-y oś y-y (sztywna) | | | | | weak axis z-z eje débil z-z oś z-z (wiotka) | | | | | | | | | | Pure bending yy | | Pure compression | | Contour enca- sement | | Hollow encasement | |
| | I _y | W _{ely} | W _{ply} | i _y | A _{vz} | I _z | W _{elz} | W _{plz} | i _z | S _s | I _t | I _w | y _s | y _m | | | | | 3 faces/sides/Seiten | 4 faces/sides/Seiten | 3 faces/sides/Seiten | 4 faces/sides/Seiten | |
| G kg/m | cm ⁴ | cm ³ | cm ³ | cm | cm ² | cm ⁴ | cm ³ | cm ³ | cm | cm | cm ⁴ | cm ⁶ x10 ³ | cm | cm | | | | | | | | | |
| 20 Y | 18,4 | 1520 | 152,0 | 175,0 | 8,1 | 11,10 | 113,0 | 20,50 | 39,00 | 2,2 | 2,2 | 5,040 | 7,110 | 2,1 | 4,1 | 1 | 1 | 1 | 2 | 258 | 291 | 206 | 239 |
| 18 Y | 16,3 | 1090 | 121,0 | 139,0 | 7,2 | 9,800 | 86,00 | 17,00 | 32,20 | 2,0 | 2,1 | 4,170 | 4,310 | 1,9 | 3,9 | 1 | 1 | 1 | 2 | 264 | 299 | 210 | 244 |
| 16 Y | 14,2 | 747,0 | 93,40 | 108,0 | 6,4 | 8,530 | 63,30 | 13,80 | 26,10 | 1,9 | 2,0 | 3,410 | 2,480 | 1,8 | 3,6 | 1 | 1 | 1 | 1 | 271 | 307 | 215 | 250 |
| 14 Y | 12,3 | 491,0 | 70,20 | 81,40 | 5,6 | 7,320 | 45,40 | 11,00 | 20,70 | 1,7 | 1,9 | 2,740 | 1,340 | 1,7 | 3,3 | 1 | 1 | 1 | 1 | 277 | 315 | 219 | 256 |
| 12 Y | 10,4 | 304,0 | 50,60 | 59,10 | 4,8 | 6,140 | 31,20 | 8,520 | 16,00 | 1,5 | 1,8 | 2,170 | 0,666 | 1,5 | 3,0 | 1 | 1 | 1 | 1 | 284 | 323 | 223 | 262 |
| 10 Y | 8,59 | 174,0 | 34,80 | 40,70 | 4,0 | 4,830 | 20,40 | 6,460 | 12,00 | 1,4 | 1,7 | 1,690 | 0,296 | 1,4 | 2,8 | 1 | 1 | 1 | 1 | 292 | 335 | 228 | 270 |
| 8 Y | 7,05 | 89,40 | 22,40 | 26,50 | 3,2 | 3,860 | 12,80 | 4,750 | 8,74 | 1,2 | 1,6 | 1,330 | 0,114 | 1,3 | 2,5 | 1 | 1 | 1 | 1 | 293 | 338 | 226 | 271 |



Connections

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Delivery conditions

Condiciones de suministro

Ogólne warunki dostawy

Rolling tolerances

The usual rolling tolerances on dimensions, shape, weight and length are given in tables 14 to 19. Specific tolerances can be reduced after agreement.

Maximum length available

The maximum length varies between 18 m and 33 m depending on the shape. Greater lengths are available only upon request.

Minimum tonnage

Unless otherwise indicated in the section tables, the minimum tonnage for any order - item is 5t per section, quality, length and destination.

Surface condition

Material is delivered in standard ex-mill condition with surface quality in accordance with EN 10163-3:2005, class C, subclass 1.

Ultrasonic testing

Ultrasonic testing is carried out upon agreement at extra cost. The procedure for this test must be agreed between the purchaser and the manufacturer.

Certification

The type of certification shall be specified at the time of order.

Terms of delivery

Please contact our local representative.

General delivery conditions

If not otherwise specified, general delivery conditions are in accordance with EN 10021:2007. The document is available upon request and can be found on the Internet site sections.arcelormittal.com.

Tolerancias de laminación

Las tolerancias de laminado habituales en las dimensiones, la forma, el peso y la longitud se indican en las tablas 14 a 19. Las tolerancias específicas pueden reducirse tras acuerdo.

Longitud máxima disponible

La longitud máxima fluctúa entre 18 y 33 m, dependiendo del perfil. Es posible suministrar longitudes superiores únicamente previa consulta.

Pedido mínimo

Salvo que se indique lo contrario en las tablas de perfiles, el pedido mínimo es de 5 toneladas por perfil, calidad, longitud y destino.

Condición de superficie

El material se suministra en condiciones estándar de fábrica cumpliendo la calidad superficial de acuerdo con EN 10163-3:2005, clase C, subclase 1.

El control por ultrasonidos

El control por ultrasonidos se realiza previo acuerdo y supone un coste adicional. El comprador y el fabricante deben acordar entre sí el procedimiento para realizar este control.

Certificación

El tipo de certificación deberá especificarse en el momento de realizar el pedido.

Plazo de entrega

Rogamos contacten con nuestro representante local.

Condiciones generales de suministro

Salvo que se indique lo contrario, las condiciones generales de suministro cumplen las especificaciones de la norma EN 10021:2007. El documento está disponible previa solicitud o en la página web sections.arcelormittal.com.

Tolerancje walcowania

Typowe tolerancje walcowania dotyczące wymiarów, kształtu, wagi i długości podano w tabelach 14 do 19. Określone tolerancje mogą zostać zredukowane po uzgodnieniu.

Maksymalna dostępna długość

Maksymalna długość waha się między 18 m i 33 m w zależności od kształtu. Większe długości dostępne są tylko na życzenie.

Minimalny tonaż

O ile nie zaznaczono inaczej w tabelach z przekrojami, minimalny tonaż dla każdej pozycji zamówienia wynosi 5t dla każdego rodzaju profilu, jakości, długości czy miejsca docelowego.

Jakość powierzchni

Materiał dostarczany jest w standardowych po-hutniczych warunkach z klasą wykończenia powierzchni wg. EN 10163-3:2005, klasa C, podklasa 1.

Badania ultradźwiękowe

Badania ultradźwiękowe są przeprowadzane po uzgodnieniu za dodatkową opłatą. Procedura tego testu musi być uzgodniona między nabywcą a producentem.

Certyfikacja

Rodzaj certyfikacji należy określić w momencie składania zamówienia.

Warunki dostarczenia

Skontaktuj się z naszym lokalnym przedstawicielem.

Ogólny warunki dostawy

Jeśli nie określono inaczej, ogólne warunki dostawy są zgodne z normą EN 10021:2007. Dokument jest dostępny na żądanie i można go znaleźć na stronie internetowej sections.arcelormittal.com.

Quality Assurance

The mills producing the sections and merchant bars of the Commercial Sections division of ArcelorMittal apply a quality, environmental, energy and occupational health and safety management system and are consequently certified ISO 9001, ISO 14001, ISO 50001 and OHSAS 45001.

Tailor-made beams

Working from the basis of specific standard beam ranges, we can offer to our clients a whole range of derived sections : tailor-made beams. The user can establish the steel section that is needed and have it rolled to measure. With our universal rolling technique, manufacture is both efficient and economic. The minimum order per tailor-made section and grade is 500 tonnes, subject to agreement.

Environmental Products Declaration

Life Cycle Assessment (LCA) of steel sections based on World Steel Association database are built on the most appropriate "End-of-Life recycling rate" methodology which considers the environmental benefits of the re-use and the recycling.

The following Environmental Product Declarations and certificates can be found on the Internet site:

- Structural steel sections in HISTAR® grades (specific from ArcelorMittal).
- Structural steel sections and merchant bars (specific from ArcelorMittal).
- Structural steel: Sections and Plates (from BauForumStahl).
- BES 6001 (Responsible sourcing).

Aseguramiento de la calidad

Las fabricas que producen las secciones y barras comerciales de la división de Secciones Comerciales de ArcelorMittal aplican un sistema de gestión de calidad, medioambiental, energía y seguridad y salud, por lo tanto, están certificados ISO 9001, ISO 14001, ISO 50001 y OHSAS 45001.

Perfiles fabricados a medida

Partiendo de la base de una gama específica de perfiles estándar, podemos ofrecer para nuestros clientes una gama completa de perfiles derivados: perfiles fabricados a medida. El usuario puede así determinar por sí mismo el perfil que desea y hacerlo laminar a medida. Gracias a nuestra técnica universal de laminación, la fabricación resulta conjuntamente eficaz y económica. El pedido de perfiles a medida está sujeto a un peso mínimo de 500 toneladas por perfil y calidad, sujeto a acuerdo.

Declaración Ambiental de Producto

El Análisis del Ciclo de Vida (ACV) de los perfiles en acero se apoya en la base de datos de la Asociación Mundial del Acero y en la metodología más apropiada de «tasa de reciclaje al final de su vida útil» la cual considera los beneficios ambientales de la reutilización y el reciclaje.

Los siguientes certificados EPD o Declaraciones Ambientales de Producto pueden encontrarse en la página de Internet:

- Perfiles de acero estructural en calidad HISTAR® (específicas de ArcelorMittal).
- Perfiles de acero estructural y barras comerciales (específicas de ArcelorMittal).
- Acero estructural: perfiles y chapas (del BauForumStahl)
- BES 6001 (abastecimiento responsable).

Zapewnienie jakości

Huty produkujące profile i pręty walcowane oddziałów Sekcji Handlowych ArcelorMittal stosują system zarządzania jakością, środowiskiem, energią i bezpieczeństwem pracy, a w konsekwencji są certyfikowane ISO 9001, ISO 14001, ISO 50001 i OHSAS 45001.

Belki dostosowane do potrzeb klienta

Pracując na podstawie określonych standardowych zakresów belek, możemy zaoferować naszym klientom całą gamę sekcji pochodnych: belki dostosowane do potrzeb klienta. Użytkownik może ustalić potrzebny stalowy przekrój i przewalcować go na miarę. Dzięki naszej uniwersalnej technice walcowania produkcja jest wydajna i ekonomiczna. Minimalne zamówienie dla różnych profili i długości kształtowników dostosowanych do potrzeb klienta wynosi 500 ton z zastrzeżeniem zgody.

Deklaracja produktów środowiskowych

Ocena cyklu życia (LCA) profili stalowych oparta na bazie danych World Steel Association opiera się na najbardziej odpowiedniej metodologii «Stopa recyklingu po zakończeniu eksploatacji», która uwzględnia korzyści dla środowiska wynikające z ponownego użycia i recyklingu.

Na stronie internetowej można znaleźć następujące deklaracje dotyczące produktów i certyfikaty środowiskowe:

- Kształtowniki ze stali konstrukcyjnej w gatunkach HISTAR® (specyficzne dla ArcelorMittal).
- Kształtowniki i pręty walcowane ze stali konstrukcyjnej (specyficzne dla ArcelorMittal).
- Stal konstrukcyjna: Kształtowniki i płaskowniki (dla BauForumStahl).
- BES 6001 (Odpowiedzialne źródła).

ArcelorMittal is at your service

ArcelorMittal está a su servicio

ArcelorMittal jest do Twojej dyspozycji

Technical support

We help you in designing and developing innovative solutions to take the best advantage of our steel.

We are happy to provide free technical advice and to answer your questions about the use of sections and merchant bars. This technical advice covers the design of structural elements, construction details, surface protection, fire safety, metallurgy and welding.

Our specialists are ready to support your initiatives anywhere in the world and to provide tailor made services to help you get better result faster with our steel.

sections.sales@arcelormittal.com

Finishing

As a complement to the technical capacities of our partners, we are equipped with high-performance finishing tools and offer a wide range of services, such as:

- drilling
- flame cutting
- T cut-outs
- notching
- cambering
- curving
- straightening
- cold sawing to exact length
- welding and fitting of studs
- shot and sand blasting
- surface treatment

Research and development

Our research center is constantly developing innovative products and solutions to meet the future needs of the construction market.

We also produce guides and software of use of our products and solutions. Check out sections.arcelormittal.com.

To facilitate the design of your projects, we also offer software and technical documentation that you can consult or download from our website free of charge: sections.arcelormittal.com

Soporte técnico

Queremos asesorarles en la concepción y el desarrollo de soluciones innovadoras para aprovechar al máximo nuestros aceros.

Nos complace ofrecerle asesoramiento técnico gratuito y responder a todas sus preguntas sobre el uso de perfiles y barras comerciales. Este asesoramiento técnico abarca el diseño de elementos estructurales, los detalles de construcción, la protección de superficies, la protección contra incendios, la metalurgia y la soldadura.

Nuestros especialistas están a su disposición para acompañar sus iniciativas en cualquier parte del planeta y para ofrecerle servicios a su medida permitiéndole optimizar el uso de nuestros aceros.

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Acabado

Para completar las posibilidades técnicas de nuestros partners, nos hemos dotado de potentes herramientas de acabado y ofrecemos una amplia gama de servicios, tales como:

- taladrado
- oxicorte
- recorte en T
- entallado
- contraflechado
- curvado
- enderezado
- aserrado en frío a la longitud exacta
- soldadura de conectores
- granallado
- tratamiento superficial

Investigación y desarrollo

Nuestro centro de investigación se encuentra en un desarrollo continuo de productos y soluciones innovadoras a fin de satisfacer las necesidades futuras del mercado de la construcción.

También producimos guías y software para el de nuestros productos y soluciones. Echa un vistazo a section.arcelormittal.com.

Para facilitar el diseño de sus proyectos, también ofrecemos software y documentación técnica que puede consultar o descargar de nuestro sitio web de forma gratuita: section.arcelormittal.com

Pomoc techniczna

Pomagamy w projektowaniu i opracowywaniu innowacyjnych rozwiązań, aby jak najlepiej wykorzystać zalety naszej stali.

Chętnie udzielimy bezpłatnej porady technicznej i odpowiemy na pytania dotyczące wykorzystania naszych kształtowników i prętów walcowanych. Nasza porada techniczna obejmuje tematy takie jak: projektowanie elementów konstrukcyjnych, szczegóły konstrukcyjne, ochrona powierzchni, bezpieczeństwo pożarowe, metalurgia i spawanie.

Nasi specjaliści gotowi są wspomóc Państwa inicjatywy w każdej części świata oraz zapewnić odpowiednio dopasowane do Państwa potrzeb usługi aby pomóc uzyskać szybciej najlepsze wyniki z wykorzystaniem naszej stali.

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Obróbka mechaniczna - wykończenie

Jako uzupełnienie możliwości technicznych naszych partnerów, jesteśmy wyposażeni w wysokiej jakości narzędzia do obróbki i oferujemy szeroki zakres usług, takich jak:

- wiercenie
- cięcie płomieniowe
- wycięcia typu T
- nacinanie
- nadawanie wstępnej krzywizny
- zakrzywianie
- prostowanie
- piłowanie na zimno do dokładnej długości
- spawanie i montaż kołków (sworzni) zespalających
- śrutowanie i piaskowanie
- obróbka powierzchni

Badania i rozwój

Nasze centrum badawcze stale opracowuje innowacyjne produkty i rozwiązania, aby sprostać przyszłym potrzebom rynku budowlanego.

Produkujemy również przewodniki i oprogramowanie do korzystania z naszych produktów i rozwiązań. Sprawdź sections.arcelormittal.com.

Aby ułatwić projektowanie naszym klientom, oferujemy również oprogramowanie i dokumentację techniczną, która jest dostępna do konsultacji lub bezpłatnego pobrania z naszej strony internetowej: sections.arcelormittal.com

Structural Software for Predesign

Software para prediseño estructural

Oprogramowanie konstrukcyjne dla projektów wstępnych

Steel solutions

ABC – Calculation of steel, partially encased and integrated beams (SFB, IFB type A and B) in cold and fire conditions. The software complies with EN 1993-1 the current state-of-the-art regarding the calculation of integrated beams.

A3C – Design of steel columns submitted to cold and fire conditions. The software complies with EN 1993-1-1 and EN 1993-1-2 rules.

PORTAL+ – Design of steel portal frames according to EN 1991-1-3, EN 1993-1-4, EN 1993-1-1 and EN 1998-1.

TRUSSES+ – Predesign of Large Span Trusses in conformity with the European rules for steel structures. The software can be used as an automatic predesign tool for verification and optimisation.

Composite solutions

ABC – Calculation of composite beams in cold and fire conditions. The software complies with EN 1994-1.

A3C – Design of partially and fully embedded composite columns, submitted to cold and fire conditions. The software complies with EN 1994-1-1 and EN 1994-1-2 rules.

CoSFB – Calculation of composite integrated beams (SFB) in cold condition.

ACP – Construction phase for composite beam. Check lateral torsional buckling during construction.

Beams solutions with large web openings

Spans and usable ceiling height can be optimised by beams with large web openings use.

ACB+ – Predesign of steel and composite beams with circular large web openings in cold and fire conditions.

ANGELINA – Predesign of steel and composite beams with sinusoidal large web openings in cold and fire situation.

Soluciones en acero

ABC – Cálculo de vigas de acero, integradas y encajonadas (SFB, IFB tipo A y B) en condiciones ambiente y de fuego. El software cumple con la EN 1993-1, vanguardia actual en lo que respecta al cálculo de vigas integradas.

A3C – Cálculo de columnas de acero y mixtas en condiciones ambiente y de fuego. El software cumple con la reglas EN 1993-1-1 y EN 1993-1-2.

PORTAL + – Diseño de pórticos de naves según la EN 1991-1-3, EN 1993-1-4, EN 1993-1-1 y EN 1998-1.

TRUSSES + – Prediseño de celosías de conformidad con las normas europeas para estructuras en acero. El software puede utilizarse como una herramienta automática de prediseño tanto para verificación como para optimización.

Soluciones mixtas

ABC – Cálculo de vigas mixtas de acero en condiciones ambiente e incendio. El software cumple con la EN 1994-1.

A3C – Diseño de columnas mixtas parcial y completamente rebestidas, sometidas a condiciones ambiente y fuego. El software cumple la EN 1994-1-1 y la EN 1994-1-2.

CoSFB – Cálculo de vigas mixtas integradas Slim Floor (SFB) en condiciones ambiente.

ACP – Fase de construcción para vigas mixtas. Verificación pandeo lateral durante la construcción.

Soluciones con vigas alveolares

Con el uso de vigas alveolares pueden optimizarse luces y altura de forjado útil.

ACB+ – Prediseño de estructuras alveolares de acero o mixtas con aberturas de alma circular en condiciones ambiente o en situación de incendio.

ANGELINA – Prediseño de vigas de acero o mixtas con alvéolos sinusoidales en condiciones de temperatura ambiente o en situación de incendio.

Rozwiązania stalowe

ABC – Obliczenia i wymiarowanie belek stalowych, częściowo obetonowanych lub zintegrowanych (SFB, IFB typ A i B) w warunkach normalnych i pożarowych. Oprogramowanie spójne jest z EN 1993-1, tj. uwzględnia aktualny stan wiedzy odnośnie obliczeń belek zintegrowanych.

A3C – Obliczenia i wymiarowanie słupów stalowych w warunkach normalnych i pożarowych. Oprogramowanie spójne jest z wymaganiami EN 1993-1-1 i EN 1993-1-2.

PORTAL + – Obliczenia i wymiarowanie stalowych ram portalowych wg. EN 1991-1-3, EN 1993-1-4, EN 1993-1-1 i EN 1998-1.

TRUSSES + – Projektowanie wstępne kratownic o dużych rozpiętościach w zgodności z europejskimi wymaganiami dla konstrukcji stalowych. Oprogramowanie może zostać użyte jako narzędzie do zautomatyzowanego projektu wstępnego i optymalizacji.

Rozwiązania zespolone

ABC – Obliczenia i wymiarowanie belek zespolonych w warunkach normalnych i pożarowych. Oprogramowanie zgodne jest z EN 1994-1.

A3C – Obliczenia i wymiarowanie słupów zespolonych obetonowanych częściowo i w pełni. Obliczenia dla warunków normalnych i pożarowych. Oprogramowanie spójne jest z wymaganiami EN 1994-1-1 i EN 1994-1-2.

CoSFB – Obliczenia belek zespolonych zintegrowanych (SFB) w warunkach normalnych.

ACP – Faza wznoszenia konstrukcji dla belek zespolonych. Sprawdzenie zwirzenia (wyboczenia giętno-skrętnego) podczas prac montażowych.

Rozwiązania dla belek ażurowych

Rozpiętość i wysokość robocza sufitu może zostać zoptymalizowana poprzez wykorzystanie belek ażurowych.

ACB+ – Projektowanie wstępne belek ażurowych stalowych i zespolonych z otworami okrągłymi w warunkach normalnych i pożarowych.

ANGELINA – Projektowanie wstępne belek ażurowych stalowych i zespolonych z otworami sinusoidalnymi w warunkach normalnych i pożarowych.

Structural Software for Predesign (continued)

Software para prediseño estructural (continúa)

Oprogramowanie konstrukcyjne dla projektów wstępnych (ciąg dalszy)

Fire Calculations

Ozone – Calculation of the gas temperature in case of fire according to EN 1991-1-2 and corresponding steel temperature according to EN 1993-1-2.

Luca – Software accompanying a design guide for industrial halls in fire conditions. This tool calculates displacements and additional horizontal forces that appear in industrial halls during fire.

MACS+ – Software designs composite floor slabs at elevated temperatures by taking into account the enhancing effects of the membrane action in slab. It also verifies the edge beams and determines the maximum temperature of each beam.

Sustainable development

AMECO – Analysis based on the principles of Life Cycle Assessment, compliant with ISO 14040 & 44, and new EN 15804 with evaluation of impacts.

Bridges

ACOBRI – Predesign of composite bridges for roads, rails and pedestria, according to EN Eurocodes.

Assembly

ACoP – ArcelorMittal Connection Programme Connection design according ENV 1993.

COP2 – Design of composite connexions according to EN 1993-1-8 and EN 1994-1-1.

Seismic

INERD – Verification of INERD constructive system in steel that can be applied to reinforce concrete frame structure.

Equaljoints Plus – A user friendly mobile app, for quick and reliable calculation and verification of seismic response of steel joints.
www.steelconstruct.com/eu-projects/equaljoints/software/

Cost Estimation

ACE – Cost Estimator for steel structure (single storey industrial buildings and multistorey commercial and residential buildings).

Resistencia al fuego

Ozono – Cálculo de la temperatura del gas en caso de incendio según EN 1991-1-2 y la correspondiente temperatura del acero según la EN 1993-1-2.

Luca – Software que acompaña a una guía de diseño para naves industriales en condiciones de incendio. Esta herramienta calcula los desplazamientos y las fuerzas horizontales adicionales que aparecen en naves industriales durante el incendio.

MACS + – La herramienta diseña forjados colaborantes a temperaturas elevadas teniendo en cuenta los efectos del fenómeno membrana en la losa. Verifica igualmente los bordes de viga y determina la temperatura máxima de cada viga.

Sostenibilidad

AMECO – Análisis basado en los principios de la evaluación del ciclo de vida, cumpliendo con la ISO 14040 y 44, nueva EN 15804 con evaluación de impactos.

Puentes

ACOBRI – Prediseño de puentes mixtos de carretera, ferrocarril y pasarelas peatonales, según Eurocodigos EN.

Montaje

ACoP – Programa de conexión ArcelorMittal Diseño de conexión según ENV 1993.

COP2 – Diseño de conexiones compuestas según EN 1993-1-8 y EN 1994-1-1.

Sismo

INERD – Verificación del sistema constructivo INERD con acero (Innovación en Diseño Antisísmico) que permite reforzar estructuras de hormigón para resistencia a terremotos.

Equaljoints Plus – Una aplicación de móvil fácil de usar, con verificación fiable y cálculo rápido para respuesta sísmica en juntas de acero.
www.steelconstruct.com/eu-projects/equaljoints/software/

Estimador de costes

ACE – Estimador de Costes para estructuras en acero (naves industriales y edificios de oficinas y residenciales).

Obliczenia pożarowe

Ozon – Obliczenia temperatury gazów wg EN 1991-1-2 i odpowiadającej temperatury konstrukcji stalowej wg EN 1993-1-2 w przypadku pożaru.

Luca – Oprogramowanie wspomagające projektowanie hal przemysłowych w warunkach pożarowych. Narzędzie oblicza przemieszczenia i dodatkowe siły poziome występujące w halach przemysłowych podczas pożaru.

MACS + – Oprogramowanie pozwalające zaprojektować strop zespolony w podwyższonej temperaturze uwzględniając korzystne efekty reakcji membranowej powstałej w stropie. Weryfikacji podlegają również belki zewnętrzne, gdzie maksymalna temperatura w każdej belce jest zdeterminowana.

Zrównoważony rozwój

AMECO – Analiza na bazie zasad obowiązujących w ocenie cyklu życia (LCA), zgodna z ISO 14040 i 44, oraz nową normą EN 15804 wraz z określeniem oddziaływań.

Mosty / wiadukty

ACOBRI – Projektowanie wstępne mostów drogowych, kolejowych i pieszych zgodnie z normami europejskimi EN (Eurokody).

Połączenia

ACoP – ArcelorMittal Connection Programme: Projektowanie i wymiarowanie połączeń wg ENV 1993.

COP2 – Projektowanie i wymiarowanie połączeń zespolonych wg EN 1993-1-8 i EN 1994-1-1.

Sejsmika

INERD – Weryfikacja stalowego systemu konstrukcyjnego INERD, który może zostać użyty do wzmocnienia konstrukcji szkieletowej słupowo-ryglowej budynku wykonanej z betonu zbrojonego.

Equaljoints Plus – Przyjazna użytkownikom aplikacja na urządzenia mobilne dla szybkich i wiarygodnych obliczeń oraz weryfikacji połączeń stalowych w warunkach sejsmicznych.
www.steelconstruct.com/eu-projects/equaljoints/software/

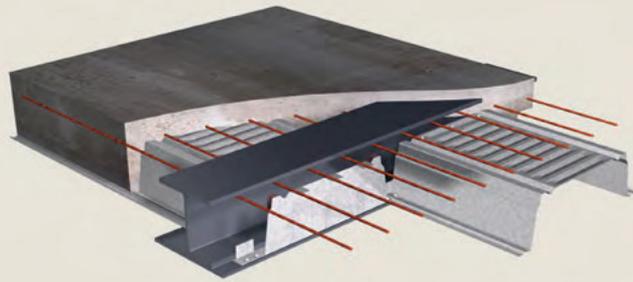
Estymacja kosztów

ACE – estymator kosztów dla konstrukcji stalowych (jednokondygnacyjne budynki przemysłowe i wielokondygnacyjne budynki komercyjne i mieszkaniowe).

Slim-floor beams

Vigas de canto reducido

Płaskie belki stropowe SlimFloor



CoSFB & Cofraplus 220

CoSFB (= SFB Composite)

CoSFB combines the advantages of slim-floor and composite construction (robustness, durability, ductile behavior, large spans, integrated fire resistance). A CoSFB is designed by replacing the traditional shear studs with reinforcement bars, placed through drilled holes in the web of the hot rolled section. Thanks to this innovative and efficient connection the stiffness of the complex is significantly increased without modifying the construction thickness (slab + beam).

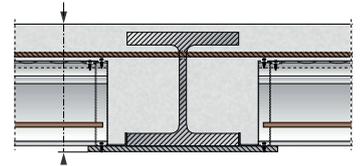
For a beam distance of 10m and a slab thickness of 40cm, beam spans up to 14m can be possible! The steel consumption of CoSFB is typically around +/- 25kg/m², including an integrated fire resistance (up to R90) and up to 40% reduced carbon footprint.

CoSFB (= Composite SFB)

CoSFB combina las ventajas del sistema slim-floor con la construcción mixta (robustez, durabilidad, comportamiento dúctil, grandes luces, resistencia al fuego integrada). Una viga CoSFB se diseña utilizando barras corrugadas en vez de conectores de cortante, colocadas a través de agujeros taladrados en el alma del perfil laminado. Gracias a esta conexión innovadora y muy eficiente, se aumenta de forma significativa la rigidez de la sección compuesta sin necesidad de modificar el canto del forjado (placa + viga). Para una distancia de 10m entre vigas y un forjado de 40cm, se pueden utilizar vigas de hasta 14m! La cantidad de acero del CoSFB es normalmente de +/- 25kg/m², incluyendo una resistencia al fuego integrada (hasta R90) y una reducción de la huella de carbono de hasta el 40%.

CoSFB (= SFB z zespoleniem)

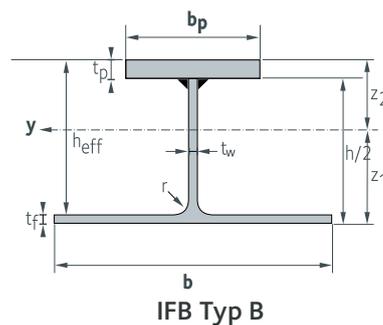
System CoSFB łączy zalety belek systemu SlimFloor oraz konstrukcji zespolonych (wytrzymałość, trwałość, plastyczne zachowanie, duże rozpiętości oraz naturalną odporność ogniową). System CoSFB został zaprojektowany przez wyeliminowanie standardowych trzpieni zespalających i zastąpienie ich przez pręty zbrojeniowe biegnące przez otwory wywiercone w środku kształtownika stalowego. Dzięki tej innowacyjnej i efektywnej metodzie połączenia, sztywność układu bez ingerencji w grubość konstrukcji (płyta + belka) została znacznie podwyższona. Dla rozstawu belek 10m oraz grubości stropu 40cm, rozpiętość belek może wynieść nawet 14m! Zużycie stali systemu CoSFB wynosi +/- 25kg/m² dla typowych rozwiązań. Naturalna odporność ogniowa wynosi do R90, natomiast szkodliwy wpływ na środowisko jest zmniejszony o 40%.



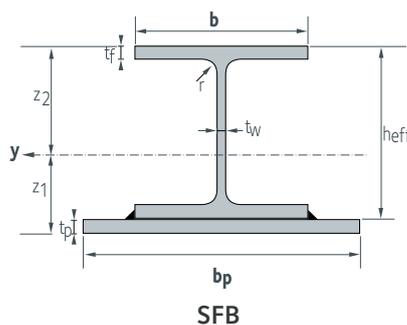
CoSFB is a predesign software for composite Slim-Floor beams (ABC is the Software for non-composite Slim-Floor beams). Visit our website for download and recent updates: sections.arcelormittal.com (Design aid)

CoSFB es un programa de prediseño para vigas mixtas SlimFloor (ABC es una herramienta de diseño para vigas no mixtas Slim Floor). Visite nuestra página web para descargar y actualizar su software: sections.arcelormittal.com (Ayuda de diseño)

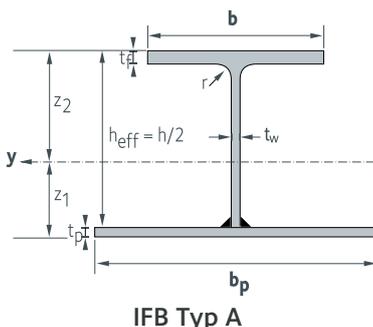
CoSFB to oprogramowanie do projektowania wstępnego belek zespolonych typu SlimFloor (ABC to oprogramowanie dla niezespolonych belek SlimFloor). Odwiedź naszą stronę internetową, aby pobrać program i najnowsze aktualizację: sections.arcelormittal.com (pomoc w projektowaniu)



IFB Typ B



SFB

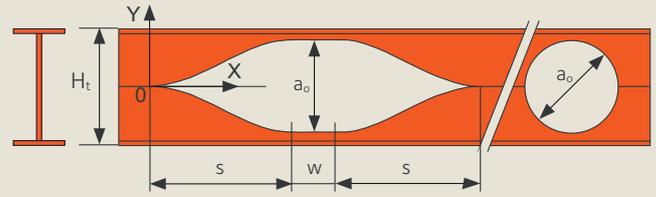


IFB Typ A

Angelina® and ACB® beams with large web openings

Vigas de alma alveolar Angelina® y ACB®

Belki ażurowe Angelina® i ACB®



Angelina® and ACB® beams are fabricated based on the exclusive use of hot rolled sections.

A double (ACB®) or single (Angelina®) cut following a specified path is made in the web through flame cutting. The two resulting T-sections are realigned and welded together. The final beam is typically 40 to 50% deeper with a 50% increase in section modulus/ load carrying capacity and a 125% increase in inertia/stiffness relative to the parent section, all this for no increase in weight.

For a given section the diameter and the spacing of openings are variable resulting in an extremely adjustable beam geometry and a perfect suitability to the project requirements.

Las vigas Angelina® y ACB® se fabrican exclusivamente a partir de perfiles laminados en caliente.

Un doble corte (para viga ACB®) y uno simple (para Angelina®) se realiza en el alma mediante oxicorte siguiendo un trazado determinado. Las dos secciones en T resultantes son realineadas y soldadas mutuamente. La sección final es aumentada en su canto, normalmente, entre un 40 y 50 % más, con un aumento del 50% en el módulo W/ capacidad de carga y un aumento del 125% en inercia/ rigidez en relación con la sección inicial, todo esto sin aumento de peso.

Para una sección dada, el diámetro y espacio entre alvéolos es variable, lo cual resulta en un amplio abanico de geometrías posibles y en una gran adaptabilidad para que ésta se ajuste a las necesidades de cada proyecto.

Belki ażurowe Angelina® i ACB® wytwarzane są wyłącznie z profili walcowanych na gorąco.

Podwójna linia cięcia (dla ACB®) wykonana przez palnik tlenowy poprowadzona jest przez środek profilu. Uzyskane w ten sposób dwa profile teowe są przesuwane względem siebie i zespawywane, tworząc nowy profil o większej wysokości. Dla belek Angelina® wykonywana jest tylko jedna linia cięcia przy użyciu lasera co skutkuje w lepszej efektywności podczas produkcji. Dzięki opisanym zabiegom, element otrzymuje poprawiony stosunek momentu bezwładności do masy.

Dla różnych przekrojów, wymiar i rozstaw otworów może być dopasowany co skutkuje w bardzo dostosowanej geometrii belki do wymagań projektu.

Applications:

Applications / Aplicaciones / Aplikacje:

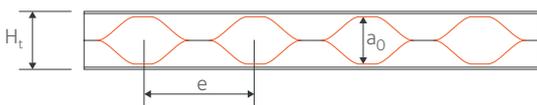
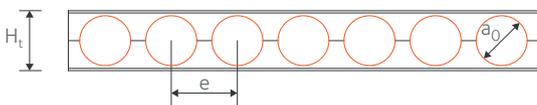
Roofing / Cubiertas / Dźwigary dachowe
Gangways / Pasarelas / Przejścia dla pieszych
Wide-span purlins / Correas de grandes luces / Płatwie dużych rozpiętości

Objective: Optimisation of the height/weight ratio
Objetivos: Optimización de la relación altura/peso
Cel: Optymalizacja stosunku wysokości do ciężaru

Starting section (height h) / Perfil original (altura h) / Wysokość profilu bazowego (h)



Design type 1 / Configuración tipo 1 / Rozwiązanie Typ 1 (ACB® and Angelina®)



$$a_0 = 1,0 \text{ to } 1,3 h$$

$$e = 1,1 \text{ to } 1,3 a_0$$

$$H_t = 1,4 \text{ to } 1,6 h$$

Common steel grades: / Calidades comunes en acero: / Typowe gatunki stali:
S355

Applications:

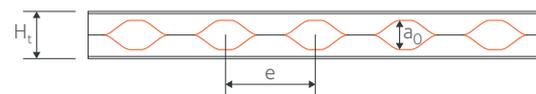
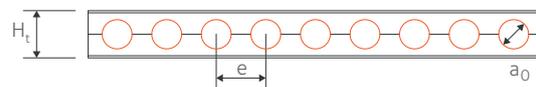
Applications / Aplicaciones/ Aplikacje:

Floors / Forjados / Stropy
Carparks / Aparcamientos / Parkingi wielopoziomowe i zadaszone
Offshore structures / Estructuras offshore / Konstrukcje przybrzeżne i morskie

Objective: Optimisation of the load/weight ratio
Objetivos: Optimización de la relación carga/peso
Cel: Optymalizacja stosunku obciążenia do ciężaru



Conception type 2 / Configuración tipo 2 / Rozwiązanie Typ 2 (ACB® and Angelina®)

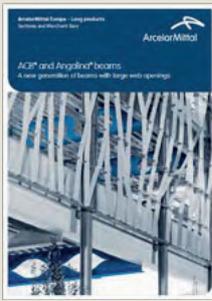


$$a_0 = 0,8 \text{ to } 1,1 h$$

$$e = 1,2 \text{ to } 1,7 a_0$$

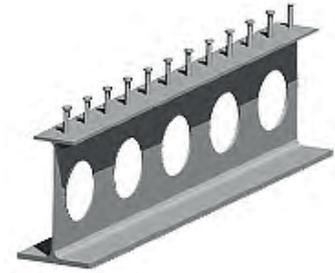
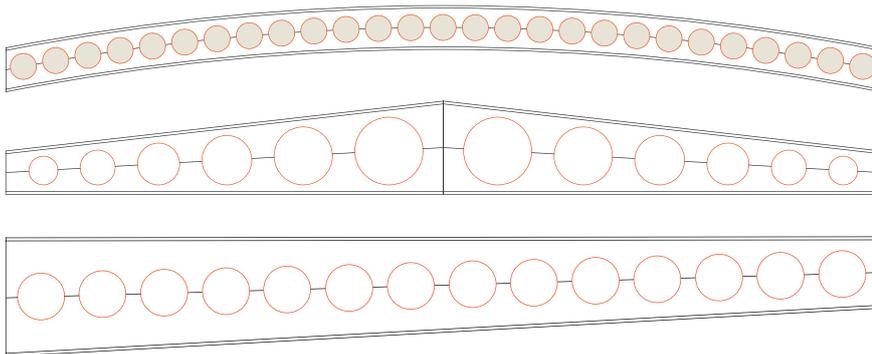
$$H_t = 1,3 \text{ to } 1,4 h$$

Common steel grades: / Calidades comunes en acero: / Typowe gatunki stali:
S355, S460, HISTAR® 460



sections.arcelormittal.com

Types of fabrication
Tipos de fabricación
Typy prefabrykacji

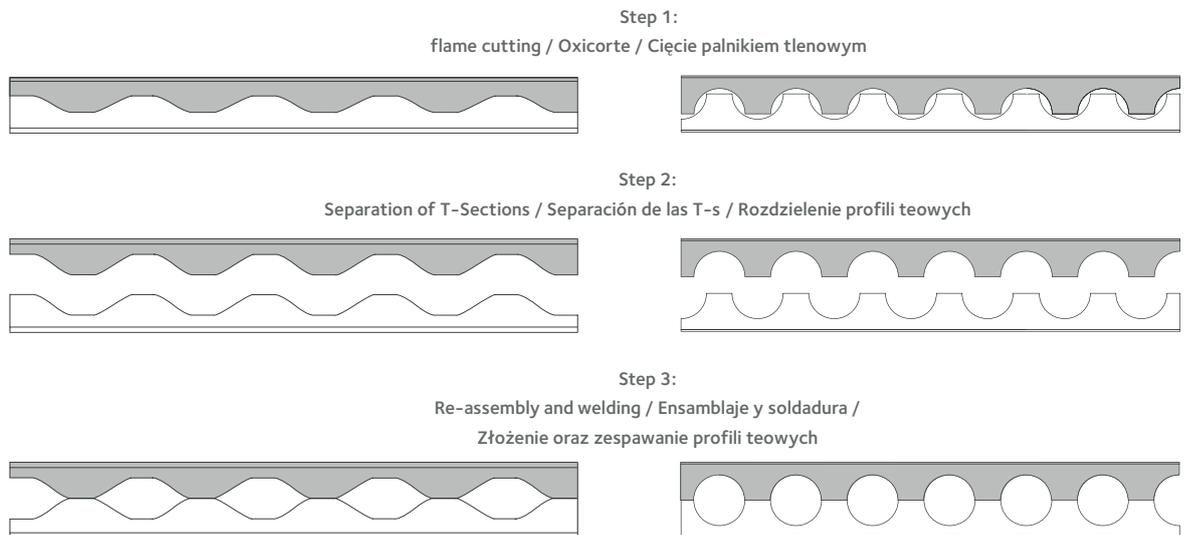


Curved and tapered ACB® / ACB® curva y ACB® de canto variable / Gięte belki ACB® oraz belki ACB® o zmiennej wysokości profilu

Concept and fabrication / Concepto y fabricación / Koncepcja i prefabrykacja

Base profiles
Perfiles originales
Profile bazowe

- IPE 300 – IPE 750
- HE 240 – HE 1000
- HL 920 – HL 1100
- HD 260 – HD 400
- UB 305 – UB 1100
- UC 305 – UC 356
- W 310 – W 1100



ACB+ and Angelina are predesign software for cellular beams. Visit our website for download and recent updates: sections.arcelormittal.com (Design aid)
ACB+ y Angelina son una herramienta de prediseño para vigas alveolares. Visite nuestra página web para descargar y actualizar su software: sections.arcelormittal.com (Ayuda de diseño)

ACB+ i Angelina to oprogramowanie do projektowania wstępnego belek ażurowych. Odwiedź naszą stronę internetową, aby pobrać program i najnowsze aktualizację: sections.arcelormittal.com (pomoc w projektowaniu)

For a detailed description and further information please consult the technical brochure ACB® and Angelina® beams available for download under sections.arcelormittal.com (Products & Solutions/Product catalogues)

Para una descripción más detallada y para ampliar información, consulte el folleto técnico ACB® y Angelina® vigas alveolares descarga disponible en sections.arcelormittal.com (Productos y Soluciones / catálogos de producto)

Szczegółowe informacje są zawarte w materiałach technicznych kształtowniki ażurowe ACB® oraz Angelina®.

Materiały dostępne na: sections.arcelormittal.com (Products & Solutions/Product catalogues)

Mega-columns and reinforced sections

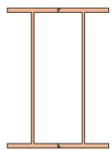
Mega-columnas y secciones reforzadas

Mega-słupy i przekroje wzmocnione

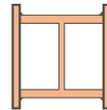
It may be attractive to reinforce the section or design a mega-column if the strength or stiffness of the heaviest section is insufficient. Our technical advisory is available to support the engineering of such solutions. From an endless choice of solutions, some more typical options are shown here as examples:

Puede resultar atractivo reforzar la sección o diseñar una mega columna si la resistencia o rigidez de la sección más pesada es insuficiente. Nuestro asesoramiento técnico está disponible para apoyar una ingeniería de este tipo de soluciones. A partir de una amplia selección de soluciones, algunas de las opciones más típicas se muestran aquí como ejemplos:

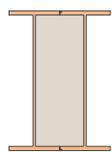
Warte rozważenia może być wzmocnienie przekroju lub zaprojektowanie mega-słupów, gdy wytrzymałość lub sztywność najcięższych profili stalowych jest niewystarczająca. Nasze doradztwo techniczne jest dostępne w celu wsparcia opracowania i zaprojektowania takich rozwiązań. Z niekończącego się wyboru rozwiązań, niektóre typowe rozwiązania przedstawione są poniżej jako przykłady:



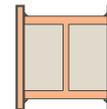
- Box Section welded from two sections
- Sección en cajón soldando dos perfiles
- Przekrój zamknięty zespawany z dwóch kształtowników



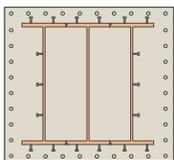
- Wide flange beam boxed with two plates
- Viga de ala ancha en caja con dos placas
- Belka szerokostopowa zamknięta dwoma płaskownikami



- Composite column box section with concrete reinforcement welded from two sections
- Pilar mixto : cajón soldando dos perfiles y relleno de hormigón
- Zespólny przekrój zamknięty zespawany z dwóch kształtowników i wypełniony betonem zbrojonym



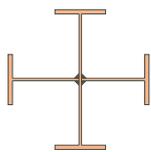
- Composite column: wide flange beam boxed in two plates and filled with concrete
- Pilar mixto : perfil de alas anchas con dos chapas soldadas y relleno de hormigón
- Słup zespolony: szerokostopowy kształtownik zamknięty dwoma płaskownikami i wypełniony betonem



- Composite column : box section welded from three sections encased in concrete
- Pilar mixto: cajón soldado tres perfiles y recubrimiento de hormigón
- Słup zespolony: przekrój zamknięty zespawany z trzech kształtowników w pełni obetonowanych w betonie zbrojonym



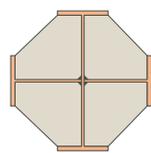
- Box section made out of one rolled section and two T sections
- Cajón con un perfil y dos secciones en T obtenidas del corte de un perfil
- Przekrój zamknięty wykonany z jednego kształtownika dwuteowego i dwóch teowników



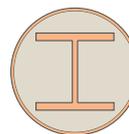
- Cruciform section made out of one rolled section and two T-sections
- Sección cruciforme con un perfil y dos secciones en T obtenidas del corte de un perfil
- Przekrój krzyżowy wykonany z jednego profilu dwuteowego i dwóch profili teowych



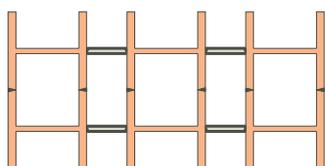
- Composite beam or column : partially encased wide flange beam
- Pilar mixto : perfil de alas anchas con recubrimiento parcial de hormigón
- Belka lub słup zespolony: kształtownik szerokostopowy częściowo obetonowany



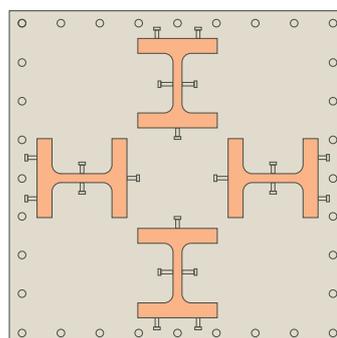
- Composite beam: cruciform beam with concrete filling
- Pilar mixto : sección cruciforme y relleno de hormigón
- Słup zespolony: przekrój krzyżowy wypełniony betonem zbrojonym



- Composite column : wide flange sections encased in concrete filled steel tube
- Pilar mixto : perfil de alas anchas en un tubo con relleno de hormigón
- Słup zespolony: kształtownik szerokostopowy obetonowany wewnątrz profilu zamkniętego wypełnionego betonem



- Mega-column built up from 6 wide flange beams and 4 connection plates
- Mega-columna construida a partir de 6 vigas de brida ancha y 4 placas de conexión
- Mega-słup zbudowany z 6 kształtowników szerokostopowych i 4 płaskowników łączących przekroje



- Mega-column without heavy plates
- Mega-columna sin chapas gruesas
- Mega-słup bez płaskowników łączących przekroje

Optimised sections

Optimised sections can provide more design flexibility. We supply numerous varieties of these tailored sections.

Secciones optimizadas

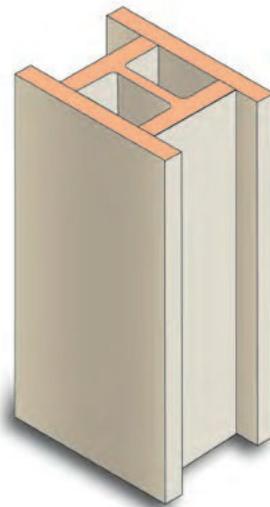
Las secciones optimizadas pueden proporcionar más flexibilidad de diseño. Suministramos numerosas variedades de estas secciones a medida.

Profile zoptymalizowane

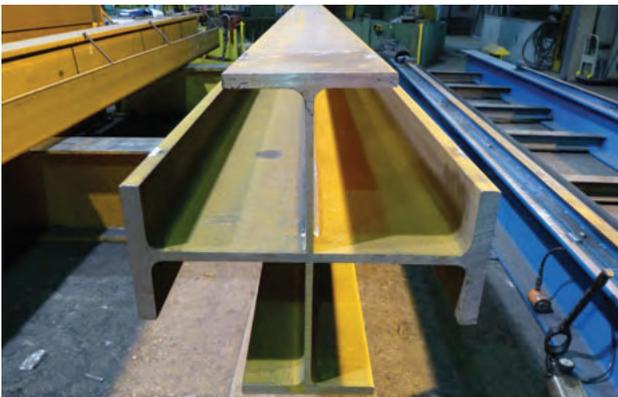
Profile zoptymalizowane mogą zapewnić większą elastyczność projektowania. Dostarczamy wiele odmian tych dopasowanych sekcji.



HD Box
Caja HD
Profil zamknięty HD



Example of rolled section with WTM
Ejemplo de sección laminada con WTM
profile walcowane z WTM



Cruciform section
Sección cruciforme
profil krzyżowy



Two heavy sections welded together
Dos secciones pesadas soldadas entre sí
Dwa ciężkie profile zespawane razem

WTM plates (Web Tailor-Made)

WTM Chapas de ancho a medida

Плоскowniki WTM (Web Tailor-Made)

Product, application and manufacturing

The unique challenges facing today's developers – including, construction sites with limited buildable land, the desire to maximize carpet area measurements, and compressed building schedules – have pressed architects, engineers and contractors to design buildings that are increasingly tall and slender within shrinking footprints and ever-decreasing construction timelines. Responding to these demands, ArcelorMittal has introduced a new product: Web Tailor-Made (WTM) steel in grades comparable to ASTM A913/A913M. These rectangularly shaped products range in dimensions from 2.5 in. [63.5 mm] (thick) by 24 in. [610 mm] (wide) to 4 in. [101.6 mm] (thick) by 40 in. [1016 mm] (wide). Produced using a thermo-mechanical rolling process (TMCP) in combination with quenching and self-tempering (QST), the favorable chemical composition of WTMs enable them to be welded with minimal to no preheat, using the welding procedures outlined in AWS D1.1 as a guideline. When used in combination with ASTM A913/A913M wide-flange (WF) shapes, or on their own, WTMs enable designers to optimise structural capacity, fabrication procedures, and cost.

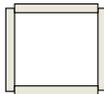
Producto, aplicación y fabricación

Los desafíos singulares a los que se enfrentan los promotores de hoy en día incluyendo, las obras de construcción con terreno edificable limitado, el deseo de maximizar las medidas del área en planta y unos cronogramas constructivos comprimidos, han llevado a los arquitectos, ingenieros y contratistas a diseñar edificios cada vez más altos reduciendo la huella de carbono y disminuyendo los plazos de construcción. En respuesta a estas demandas, ArcelorMittal ha introducido un nuevo producto: chapa de acero hecha a medida (WTM) en calidades comparables a ASTM A913 / A913M. Estos productos de forma rectangular varían en dimensiones de 2.5 pulg. [63.5 mm] (grueso) por 24 pulg. [610 mm] (ancho) a 4 pulg. [101.6 mm] (grueso) por 40 pulg. [1016 mm] (ancho). Son producidos usando un proceso de laminación termomecánica combinado (TMCP) consistente en un templado y auto-revenido (QST), la composición química favorable de los WTM les permite soldarse sin precalentamiento o mínimo, utilizando los procedimientos de soldadura descritos en AWS D1.1 como guía. Cuando se usan en combinación con ASTM Las formas de brida ancha (WF) ASTM913 / A913M, o por sí solas, permiten a los diseñadores optimizar la capacidad estructural, los procedimientos de fabricación y coste.

Produkt, zastosowanie i produkcja

Wyjątkowe wyzwania jakim stawiają czoła dzisiejsi deweloperzy – włączając, place budów o ograniczonym obszarze, chęć zmaksymalizowania obszaru najmu oraz wąskie terminarze budów – wymagają od architektów, inżynierów i wykonawców projektowania budynków, które są coraz wyższe i smukłe przy jednoczesnym zmniejszaniu obszaru oddziaływania, a nawet skracaniu czasu budów. W odpowiedzi do tych wymagań, ArcelorMittal wprowadził nowy produkt: stal WTM (Web Tailor-Made) w gatunkach odnoszących się do ASTM A913/A913M. Te prostokątne płaskowniki dostarczają zakres wymiarów od 2.5 cala [63.5 mm] (grubość) na 24 cali [610 mm] (szerokość) do 4 cali [101.6 mm] (grubość) na 40 cali [1016 mm] (szerokość). Wyprodukowane przy użyciu procesu walcowania termomechanicznego (Thermo-Mechanical Rolling Process, TMCP) w połączeniu z procesem ulepszenia cieplnego (Quenching and Self-Tempering, QST), korzystna kompozycja chemiczna stali WTM pozwala na spawanie jej z minimalnym lub nawet przy braku podgrzewania wstępnego. Procedury przedstawione w AWS D1.1 stanowią przewodnik procesu spawania. Gdy płaskowniki użyte są w połączeniu z kształtownikami szerokostopowymi (Wide-Flange, WF) w gatunku ASTM A913/A913M, lub same, płaskowniki WTM pozwalają projektantom zoptymalizować możliwości konstrukcji, procedury prefabrykacji, a także koszty.

Innovative solutions using WTMs / Soluciones innovadoras que utilizan WTMs / Innowacyjne rozwiązania wykorzystujące płaskowniki WTM

| Axial compression/Compresión axial/ Ściskanie osiowe | |  reference |  |  |  |
|---|-------------------------------------|--|---|---|---|
| Buckling Length/ Longitud de pandeo/Długość wyboczeniowa = 31 ft (9.5 m) | | Rolled WF Shape W 14 x 873 (W 360 x 1299) | W 14 x 873 + 2 x WTM 40 x 544 (HD 400 x 1 299 + 2 x WTM 1 016 x 810) | Box of 4 x WTM 40 x 544 (WTM 1 016 x 810) | Stack of 10 x WTM 40 x 544 (WTM 1 016 x 810) |
| Weight Peso Ciężar | lb/ft | 873 | 1 961 | 2 181 | 5 440 |
| | (kg/m) | (1 299) | (2 919) | (3 240) | (8 100) |
| | % | 100 | 225 | 250 | 623 |
| Max. Axial Load/ Max. Carga axial/ maks. Obciążenie osiowe | kips (kN) | 8 604 (38 273) | 28 835 (128 646) | 35 642 (159 080) | 84 260 (378 239) |
| | % | 100 | 335 | 414 | 979 |
| | % weight/peso /waga | 100 | 149 | 166 | 157 |
| Inertia, weak axis/ Inercia, eje débil/ Promień bezwładności, słaba oś | in. ⁴ (cm ⁴) | 6 111 (254 372) | 48 184 (1 994 075) | 171 095 (7 121 545) | 200 210 (8 879 604) |
| | % | 100 | 788 | 2 800 | 3 276 |
| | % weight/peso /waga | 100 | 351 | 1 121 | 526 |
| Inertia, strong axis/ Inercia, eje fuerte/ Promień bezwładności, silna oś | in. ⁴ (cm ⁴) | 18 129 (754 600) | 60 866 (2 530 521) | 197 975 (8 240 377) | 200 210 (8 333 333) |
| | % | 100 | 336 | 1 092 | 1 104 |
| | % weight/peso /waga | 100 | 149 | 437 | 177 |

Product designation of WTM is width x unit weight (lb/ft, respectively kg/m)

La designación del producto para las chapas WTM es ancho x unidad de peso (lb/ft, respectivamente kg/m).

Oznaczenie płaskowników WTM zawiera szerokość x ciężar jednostkowy (lb/ft, odpowiednio kg/m)

| Thickness/Espesor/Grubość (inch/ pulgada/cale) | Width/Ancho/Szerokość (inch/ pulgada/cale) | | | | |
|---|--|--------------|--------------|--------------|--------------|
| | 24 | 28 | 32 | 36 | 40 |
| 4 | WTM 24 x 327 | WTM 28 x 381 | WTM 32 x 436 | WTM 36 x 490 | WTM 40 x 544 |
| 3,5 | WTM 24 x 286 | WTM 28 x 333 | WTM 32 x 381 | WTM 36 x 429 | WTM 40 x 476 |
| 3 | WTM 24 x 245 | WTM 28 x 286 | WTM 32 x 327 | WTM 36 x 368 | WTM 40 x 408 |
| 2,75 | WTM 24 x 225 | WTM 28 x 262 | WTM 32 x 299 | WTM 36 x 337 | WTM 40 x 374 |
| 2,5 | WTM 24 x 204 | WTM 28 x 238 | WTM 32 x 272 | WTM 36 x 306 | WTM 40 x 340 |

| Thickness/Espesor/Grubość (mm) | Width/Ancho/Szerokość (mm) | | | | |
|-----------------------------------|----------------------------|---------------|---------------|---------------|----------------|
| | 609,6 | 711,2 | 812,8 | 914,4 | 1 016 |
| 101,6 | WTM 610 x 486 | WTM 710 x 567 | WTM 810 x 648 | WTM 915 x 729 | WTM 1016 x 810 |
| 88,9 | WTM 610 x 425 | WTM 710 x 496 | WTM 810 x 567 | WTM 915 x 638 | WTM 1016 x 709 |
| 76,2 | WTM 610 x 365 | WTM 710 x 425 | WTM 810 x 486 | WTM 915 x 547 | WTM 1016 x 608 |
| 69,8 | WTM 610 x 334 | WTM 710 x 390 | WTM 810 x 446 | WTM 915 x 501 | WTM 1016 x 557 |
| 63,5 | WTM 610 x 304 | WTM 710 x 355 | WTM 810 x 405 | WTM 915 x 456 | WTM 1016 x 506 |

Available grades and mechanical properties (comparable to ASTM A913/A913M).

Calidades disponibles y propiedades mecánicas (en relación a la norma ASTM A913/A913M).

Dostępne gatunki stali i własności mechaniczne (porównywalne do ASTM A913/A913M).

| Grade/Grado/Klasa | Yield point/Punto de rendimiento/Granică plastyczności, ksi [MPa], min. | Tensile strength/Resistencia a la tracción/wytrzymałość na rozciąganie, ksi [MPa], min. | Transverse elongation/Elongación transversal/ciągliwość poprzeczna, min. 8 in. [200 mm], % | Elongation/Alargamiento/ciągliwość min. 2 in. [50 mm], % |
|-------------------|---|---|--|--|
| A913-Grade 65 | 65 [450] | 80 [550] | 12 | 17 |



Notations and formulae

Anotaciones y fórmulas

Oznaczenia i wzory

Where possible, the designations correspond to those of the Eurocode.

Not standardised values are given in the tables for information only.

The formulae printed on a coloured background are only valid for I and H sections with parallel flanges.

Las designaciones corresponden, en la medida de lo posible, a las del Eurocódigo.

Los valores no normalizados se dan en las tablas solo a título informativo.

Las fórmulas que aparecen sobre un fondo coloreado únicamente son válida para los perfiles I y H con alas paralelas.

Tam, gdzie to możliwe, oznaczenia odpowiadają oznaczeniom z norm europejskich Eurocode.

Nie znormalizowane wartości podane są w tabelach tylko w celach informacyjnych.

Wzory podane z tłem w kolorze są ważne tylko dla dwuteowników równoległościennych I i H.

A area of section

A área de la sección

A pole powierzchni przekroju

$$A = 2 t_f b + (h - 2 t_f) t_w + (4 - \pi) r^2$$

a size

a tamaño

a wielkość

A_G painting surface per unit mass

A_G superficie a pintar por unidad de masa

A_G powierzchnia malowania na jednostkę masy

$$A_G = \frac{A_L}{A \cdot \rho_a}$$

A_L painting surface per unit length

A_L superficie a pintar por unidad de longitud

A_L powierzchnia malowania na jednostkę długości

$$A_L = [4 (b - 2 r) + 2 (h - t_w) + 2 \pi r] \frac{L}{L}$$

A_{p/v} section factor (m⁻¹)

is the value of the perimeter of the steel section in case of fire protection by contour encasement or the value 2(b+h) in case of hollow encasement divided by the steel cross section area. The factor is given in the table for 3 sides and for all sides fire exposure.
[≈ W/D (kg/m²) according to ANSI/AISC 360]

A_{p/v} factor de perfil (m⁻¹)

es el valor del perímetro del perfil de acero en caso de protección contra incendios mediante el contorno del cerramiento o el valor 2(b+h) en caso de revestimiento hueco dividido por el área transversal del perfil de acero. El factor es dado en la tabla para 3 lados y para todos los lados de exposición al fuego.
[≈ W/D (kg/m²) según ANSI/AISC 360]

A_{p/v} współczynnik przekroju (m⁻¹)

jest to wartość obwodu przekroju stalowego, uwzględniając zabezpieczenie przeciwpożarowe poprzez obudowanie obwodowe lub wartość 2(b+h) w przypadku obudowy drążonej, podzielonego przez pole przekroju poprzecznego profilu stalowego. Współczynnik podany jest w tabeli dla 3 i dla wszystkich stron ekspozycji ogniowej.
[≈ W/D (kg/m²) według ANSI/AISC 360]

A_{vz} shear area
load parallel to web

A_{vz} área a cortante
carga paralela al alma

A_{vz} pole powierzchni ścinania
obciążenie równoległe do środka

$$A_{vz} = A - 2 b t_f + (t_w + 2 r) t_f$$

α inclination of main axes of inertia

α inclinación de los ejes principales de inercia

α nachylenie głównych osi bezwładności

b width
[= B for angles ASTM A6/A6M]

b anchura del perfil
[= B para ángulos ASTM A6 / A6M]

b szerokość
[= B dla kątowników wg ASTM A6/A6M]

d depth of straight portion of web

d altura de la parte recta del alma

d głębokość prostej części środka

$$d = h - 2 t_f - 2 r$$

G mass per unit length
[=W according to ASTM A6/A6M]

G masa por unidad de longitud
[= W según ASTM A6 / A6M]

G masa na jednostkę długości
[=W wg ASTM A6/A6M]

$$G = A \rho_a$$

h depth
[= d for profiles ASTM A6/A6M]
[= B for angles ASTM A6/A6M]

h altura del perfil
[= d para perfiles ASTM A6 / A6M]
[= B para ángulos ASTM A6 / A6M]

h głębokość
[= d dla kształtowników wg ASTM A6/A6M]
[= B dla kątowników wg ASTM A6/A6M]

h_i inner depth between flanges

h_i altura interior entre las alas

h_i wewnętrzna głębokość pomiędzy stopkami

$$h_i = h - 2 t_f$$

I second moment of area

I momento de inercia de flexión

I geometryczny moment bezwładności powierzchni względem osi

$$I_y = \frac{1}{12} [b h^3 - (b - t_w) (h - 2 t_f)^3] + 0,03 r^4 + 0,2146 r^2 (h - 2 t_f - 0,4468 r)^2$$

$$I_z = \frac{1}{12} [2 t_f b^3 + (h - 2 t_f) t_w^3] + 0,03 r^4 + 0,2146 r^2 (t_w + 0,4468 r)^2$$

i radius of gyration

i radio de giro

i promień bezwładności

$$i_y = \sqrt{\frac{I_y}{A}} \quad i_z = \sqrt{\frac{I_z}{A}} \quad i_u = \sqrt{\frac{I_u}{A}} \quad i_v = \sqrt{\frac{I_v}{A}}$$

I_t torsion constant

I_t módulo de torsión

I_t stała skręcania

$$I_t = \frac{2}{3} (b - 0,63 t_f) t_f^3 + \frac{1}{3} (h - 2 t_f) t_w^3 + [-0,042 + 0,2204 \frac{t_w}{t_f} + 0,1355 \frac{r}{t_f} - 0,0865 (\frac{r t_w}{t_f^2}) - 0,0725 (\frac{t_w}{t_f})^2] [\frac{(r + t_w/2)^2 + (r + t_f)^2 - r^2}{2 r + t_f}]^4$$

I_w warping constant
referred to the shear centre

I_w módulo de alabeo
con respecto al centro de cortadura

I_w stała zwężenia w
odniesieniu do punktu ścinania

$$I_w = \frac{t_f b^3}{24} \times (h - t_f)^2$$

I_{yz} centrifugal moment

I_{yz} producto de inercia

I_{yz} moment odśrodkowy

r, r₁ radius of root fillet

r, r₁ radio de acuerdo de la unión
entre el alma y el ala

r, r₁ promień zaokrąglenia

r₂, r₃ toe radius

r₂, r₃ radio de acuerdo del borde del ala

r₂, r₃ promień brzegu

ρ_a unit mass of steel

ρ_a densidad del acero

ρ_a masa jednostkowa stali

s_s length of stiff bearing

s_s longitud del apoyo rígido

s_s długość sztywnego oparcia

$$s_s = t_w + 2 t_f + (4 - 2 \sqrt{2}) r$$

The length of stiff bearing on the flange is the distance over which an applied force is effectively distributed. It influences the resistance of the unstiffened web of an adjacent section to transverse forces.

La longitud del apoyo rígido del ala es la distancia sobre la cual se distribuye eficazmente una carga. Este valor repercute en la resistencia a los esfuerzos transversales del alma de un perfil adyacente que carezca de elemento rigidizador.

Długość sztywnego oparcia półki jest długością na jakiej przyłożona siła rozkłada się efektywnie. Ma to wpływ na nośność nieusztywnionego środka przylegającego kształtownika na poprzeczne siły.

Notations and formulae (continued)

Anotaciones y fórmulas (continúa)

Oznaczenia i wzory (ciąg dalszy)

| | | | | | |
|-----------------------|---|-----------------------|---|-----------------------|--|
| t | thickness | t | espesor | t | grubość |
| t_f | flange thickness [= t EN 10365:2017] | t_f | espesor del ala [= t EN 10365:2017] | t_f | grubość stopki [= t EN 10365:2017] |
| t_w | web thickness [= s EN 10365:2017] | t_w | espesor del alma [= s EN 10365:2017] | t_w | grubość środnika [= s EN 10365:2017] |
| u | distance of extreme fibre to minor v-axis | u | distancia de la fibra extrema al eje menor v | u | odległość ekstremalnego włókna do mniejszej osi v |
| v | distance of extreme fibre to major u-axis | v | distancia de la fibra extrema al eje mayor u | v | odległość skrajnych włókien w stosunku do głównej osi u |
| V | volume of the steel member per unit length | V | volumen del elemento metálico por unidad de longitud | V | objętość elementu stalowego na jednostkę długości |
| W_{el} | elastic section modulus | W_{el} | módulo elástico | W_{el} | moduł sprężystości kształtownika |

$$W_y = \frac{2 \cdot I_y}{h} \quad W_z = \frac{2 \cdot I_z}{b}$$

| | | | | | |
|-----------------------|--|-----------------------|--|-----------------------|---|
| W_{pl} | plastic section modulus | W_{pl} | módulo plástico | W_{pl} | moduł plastyczności kształtownika |
| | For plastic design, the cross-section must be compact or belong to class 1 or 2 according to the required rotation capacity. | | Para un diseño plástico, la sección transversal deberá pertenecer a la clase 1 ó 2 según la capacidad de rotación necesaria. | | Dla obliczeń plastycznych, przekrój poprzeczny musi być zwarty lub należeć do klasy 1 bądź 2 zgodnie wymaganą zdolnością do obrotu. |

$$W_{pl,y} = \frac{t_w h^2}{4} + (b - t_w) (h - t_f) t_f + \frac{4 - \pi}{2} r^2 (h - 2 t_f) + \frac{3\pi - 10}{3} r^3$$

$$W_{pl,z} = \frac{b^2 t_f}{2} + \frac{h - 2 t_f}{4} t_w^2 + r^3 \left(\frac{10}{3} - \pi \right) + \left(2 - \frac{\pi}{2} \right) t_w \times r^2$$

For channels:

W_{pl,z'} plastic section modulus referred to plastic neutral z' axis which is parallel to z axis.

Para perfiles en U:

W_{pl,z'} módulo plástico referido al eje neutro plástico z' paralelo al eje z.

Dla ceowników:

Moduł plastyczności W_{pl,z'} kształtownika odnosi się do plastycznej osi neutralnej z', równoległej do osi z.

| | | | | | |
|--|---|--|--|--|---|
| y_m | distance of shear centre | y_m | distancia del centro de cortante | y_m | odległość od środka ścinania |
| y_s | distance of centre of gravity along y-axis | y_s | distancia del centro de gravedad a lo largo del eje y | y_s | odległość od środka ciężkości wzdłuż osi y |
| z_s, z₁, z₂ | distance of centre of gravity along z-axis | z_s, z₁, z₂ | distancia del centro de gravedad a lo largo del eje z | z_s, z₁, z₂ | odległość od środka ciężkości wzdłuż osi z |

Classification of cross-sections

according to EN 1993-1-1 2005

Clasificación de las secciones transversales

según EN 1993-1-1 2005

Klasyfikacja przekrojów poprzecznych

wg EN 1993-1-1 2005

Class 1 – These cross-sections can form a plastic hinge with the rotation capacity required for plastic analysis.

Class 2 – These cross-sections can develop their plastic moment resistance, but have limited rotation capacity.

Class 3 – Cross-sections of class 3 are those in which the calculated stress in the extreme compression fibre of the steel member can reach its yield strength, but local buckling is liable to prevent development of the plastic moment resistance.

Class 4 – Cross-sections of class 4 are those in which it is necessary to make explicit allowances for the effects of local buckling when determining their moment resistance or compression resistance.

In the structural shapes tables, the classification of the sections is indicated for both cases "pure bending" about strong axis y-y (web in bending, flange in compression) and "pure compression" (web and flange in compression).

Clase 1 – Secciones transversales en las que se puede formar una rótula plástica con la capacidad de rotación necesaria para un análisis plástico.

Clase 2 – Secciones transversales en las que se puede alcanzar el momento plástico, pero con una capacidad de rotación limitada.

Clase 3 – Secciones transversales en las que la tensión calculada en la fibra más comprimida del elemento de acero puede alcanzar el límite elástico y en las que el pandeo local puede impedir alcanzar el momento plástico.

Clase 4 – Secciones transversales en las que, para determinar su resistencia al momento flector o a la compresión, es necesario tener en cuenta explícitamente los efectos locales del pandeo.

En las tablas de perfiles estructurales, se indica la clasificación de los perfiles tanto en términos de «flexión pura» sobre el eje principal y-y (alma flexionada, ala comprimida) como de «compresión pura» (alma y ala comprimidas).

Klasa 1 – Te przekroje poprzeczne mogą tworzyć plastyczny przegub, o zdolności obrotowej wymaganej dla analizy plastycznej.

Klasa 2 – Te przekroje poprzeczne mogą rozwinąć swoją nośność na moment plastyczny, ale posiadają ograniczoną zdolność obrotową.

Klasa 3 – Przekroje poprzeczne klasy 3 są przekrojami, w których obliczone naprężenie w podlegających ścisnaniu skrajnych włóknach elementu stalowego może osiągnąć swoją granicę plastyczności, ale lokalne wyboczenie ogranicza wzrost momentu plastycznego.

Klasa 4 – Przekroje poprzeczne klasy 4 są przekrojami, w których niezbędne jest uwzględnienie bezpośrednich skutków lokalnego wyboczenia podczas określania ich nośności na zginanie lub ściskanie.

W tabelach kształtowników konstrukcyjnych, klasyfikacja kształtowników jest oznaczona dla obu przypadków jako «zginanie czyste» wokół sztywnej osi y-y (środek w zginaniu, stopka w ścisnaniu) oraz «ściskanie czyste» (środek i stopka w ścisnaniu).

Table 14

Rolling tolerances - beams

Tabla 14

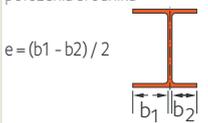
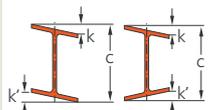
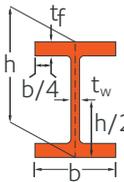
Tolerancias de laminación - Perfiles

Tabela 14

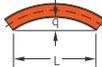
Tolerancje walcownicze - Belki

| Sections Secciones Sekcje | IPE HE HD UB/UC/UBP HL HLZ HP (EN) (incl. dimensions ArcelorMittal standard) | IPN J | W, HP (ASTM) (incl. dimensions ArcelorMittal standard) | S | B1, B2 G ≤ G ₁₈₈₂ | B1, B2, B3, SZ1, SZ2 K1, K2, K3, K4, K5 G > G ₁₈₈₂ | Tailor-made sections Secciones a medida Przekroje dostosowane |
|---------------------------------|--|---------------|--|--------------------|-------------------------------------|--|---|
| Standards / Normas / Normami | EN 10034:1993 ⁴⁾ | EN 10024:1995 | ASTM A 6/A 6M - 16 | ASTM A 6/A 6M - 16 | GOST 26020-83 | STO ASCHM 20-93 | ArcelorMittal Standard |

| Depth Altura Głębokość | h (mm) (in.) | h ≤ 180 180 < h ≤ 400 400 < h ≤ 700 h > 700 | +3/-2 +4/-2 +5/-3 +5/-5 | h ≤ 200 200 < h ≤ 400 h > 400 | ±2 ±3 ±4 | +4/-3 [+ ¹ / ₈ / - ¹ / ₈] | 75 < h ≤ 180 180 < h ≤ 360 360 < h ≤ 610 [3 < h ≤ 7] [7 < h ≤ 14] [14 < h ≤ 24] | ±2 +3/-2 +5/-3 [+ ³ / ₃₂ / - ¹ / ₁₆] [+ ¹ / ₈ / - ³ / ₃₂] [+ ³ / ₁₆ / - ¹ / ₈] | h ≤ 120 120 < h < 380 380 < h < 580 h ≥ 580 | ±2,0 ±3,0 ±4,0 ±5,0 | h ≤ 120 120 < h < 380 380 < h < 580 h > 580 | ±2,0 ±3,0 ±4,0 ±5,0 | h ≤ 180 180 < h ≤ 400 400 < h ≤ 700 h > 700 | +4/-3 +5/-3 +6/-4 +6/-6 |
|--|------------------------|--|--|--|--|--|---|--|--|--|--|--|--|--|
| Flange width Anchura de alma Szerokość stopki | b (mm) (in.) | b ≤ 110 110 < b ≤ 210 210 < b ≤ 325 b > 325 | +4/-1 +4/-2 +4/-4 +6/-5 | b ≤ 75 75 < b ≤ 100 100 < b ≤ 125 b > 125 | ±1,5 ±2 ±2,5 ±3 | +6/-5 [+ ¹ / ₄ / - ³ / ₁₆] | 75 < h ≤ 180 180 < h ≤ 360 360 < h ≤ 610 [3 < h ≤ 7] [7 < h ≤ 14] [14 < h ≤ 24] | ±3 ±4 ±5 [± ¹ / ₈] [± ⁵ / ₃₂] [± ³ / ₁₆] | b ≤ 120 b > 120 | ±2,0 ±3,0 | h ≤ 120 h > 120 | ±2,0 ±3,0 | b ≤ 110 110 < b ≤ 210 210 < b ≤ 325 b > 325 | +5/-2 +5/-3 +5/-5 +7/-6 |
| Web thickness Espesor de ala Grubość środnika | t _w (mm) | t _w < 7 7 ≤ t _w < 10 10 ≤ t _w < 20 20 ≤ t _w < 40 40 ≤ t _w < 60 t _w ≥ 60 | ±0,7 ±1 ±1,5 ±2 ±2,5 ±3 | t _w ≤ 7 7 < t _w ≤ 10 t _w > 10 | +0,5/-1 +0,7/-1,5 +1/-2 | limited by mass tolerance limitado por la tolerancia de masa Ograniczona tolerancja masy | | | t _w ≤ 4,4 4,4 < t _w ≤ 6,5 6,5 < t _w < 16 16 ≤ t _w < 23 t _w ≥ 23 | ±0,5 ±0,7 ±1,0 ±1,5 ±2,0 | t _w ≤ 4,4 4,4 < t _w ≤ 6,5 6,5 < t _w < 16 16 ≤ t _w < 23 t _w ≥ 23 | ±0,5 ±0,7 ±1,0 ±1,5 ±2,0 | t _w < 7 7 ≤ t _w < 10 10 ≤ t _w < 20 20 ≤ t _w < 40 40 ≤ t _w < 60 t _w ≥ 60 | ±0,7 ±1 ±1,5 ±2 ±2,5 ±3 |
| Flange thickness Espesor de ala Grubość stopki | t _f (mm) | t _f < 6,5 6,5 ≤ t _f < 10 10 ≤ t _f < 20 20 ≤ t _f < 30 30 ≤ t _f < 40 40 ≤ t _f < 60 t _f ≥ 60 | +1,5/-0,5 +2/-1 +2,5/-1,5 +2,5/-2 ±2,5 ±3 ±4 | t _f ≤ 7 7 < t _f ≤ 10 10 < t _f ≤ 20 t _f > 20 | +1,5/-0,5 +2/-1 +2,5/-1,5 +2,5/-2 | limited by mass tolerance limitado por la tolerancia de masa Ograniczona tolerancja masy | | | t _f ≤ 6,3 6,3 < t _f < 16,0 16,0 ≤ t _f < 25,0 25,0 ≤ t _f < 40 | ±1,0 ±1,5 ±2,0 ±2,5 | t _f ≤ 6,3 6,3 < t _f < 16 16 ≤ t _f < 25 25,0 ≤ t _f | ±1,0 ±1,5 ±2,0 ±2,5 | t _f < 6,5 6,5 ≤ t _f < 10 10 ≤ t _f < 20 20 ≤ t _f < 30 30 ≤ t _f < 40 40 ≤ t _f < 60 t _f ≥ 60 | +1,5/-0,5 +2/-1 +2,5/-1,5 +2,5/-2 ±2,5 ±3 ±4 |
| Out-of-square Falta de paralelismo Nierównoległość stopek | k+k' (mm) (in.) | b ≤ 110 b > 110 | 1,5 0,02 b (max. 6,5) | b ≤ 100 b > 100 | 2 0,02 b | h ≤ 310 h > 310 [h ≤ 12] [h > 12] | k+k' ≤ 6 k+k' ≤ 8 [k+k' ≤ ¹ / ₄] [k+k' ≤ ⁵ / ₁₆] c ≤ h+6 [c ≤ h+ ¹ / ₄] | 0,03 b [¹ / ₃₂ b] | h ≤ 120 120 < h ≤ 290 h > 290 | k+k' ≤ 1,0 k+k' ≤ 0,015b (max. 3,0) k+k' ≤ 0,015b (max. 4,0) | h ≤ 120 120 < h ≤ 290 h > 290 | k+k' ≤ 1,0 k+k' ≤ 0,015b (max. 3,0) k+k' ≤ 0,015b (max. 4,0) | b < 110 b > 110 | 1,5 0,03 b (max. 8,0) |
| Web off-centre Asimetría alma Niesymetryczność położenia środnika | e (mm) (in.) | t _f < 40: b ≤ 110 110 < b ≤ 325 b > 325 t _f ≥ 40: 110 < b ≤ 325 b > 325 | 2,5 3,5 5 5 8 | b ≤ 100 b > 100 | 2 3 | G ≤ 634 kg/m G > 634 kg/m [G ≤ 426 lbs/ft] [G > 426 lbs/ft] | 5 8 [³ / ₁₆] [⁵ / ₁₆] | 5 [³ / ₁₆] | h ≤ 120 120 < h < 190 190 ≤ h ≤ 290 h > 290, b < 220 h > 290, b ≥ 220 | 1,5 2,5 3,0 3,0 4,5 | h ≤ 120 120 < h < 190 190 ≤ h ≤ 290 h > 290, b < 220 h > 290, b ≥ 220 | 1,5 2,5 3,0 3,0 4,5 | t _f < 40: b ≤ 110 110 < b ≤ 325 b > 325 | 3,5 4,5 6 6 8 |



| | | | | | | | |
|---------------------------------|--|---------------|--|--------------------|-------------------------------------|--|--|
| Sections Secciones Sekcje | IPE HE HD UB/UC/UBP HL HLZ HP (EN) (incl. dimensions ArcelorMittal standard) | IPN J | W, HP (ASTM) (incl. dimensions ArcelorMittal standard) | S | B1, B2 G ≤ G ₁₈₈₂ | B1, B2, B3, SZ1, SZ2 K1, K2, K3, K4, K5 G > G ₁₈₈₂ | Tailor-made sections Perfiles a medida Kształtownikami o szczególnych własnościach |
| Standards / Normas / Normami | EN 10034:1993 ⁴⁾ | EN 10024:1995 | ASTM A 6/A 6M - 16 | ASTM A 6/A 6M - 16 | GOST 26020-83 | STO ASCHM 20-93 | ArcelorMittal Standard |

| | | | | | | | | | | | | | |
|---|---|--------------------------------|--|--|--|--|---|--|---|---|--------------------------------|----------------------------------|----|
| Straightness Rectitud Prostoliniowość  | q _y /q _z (mm) [in.] | 80<h≤180 180<h≤360 h>360 | 0,0030 L 0,0015 L 0,0010 L | 80<h≤180 180<h≤360 h>360 | 0,0030 L 0,0015 L 0,0010 L | b<150 b≥150 [b<6] [b≥6] | 0,002L ²⁾ 0,001L ²⁾ [1/8 x L(ft)/5] ²⁾ [1/8 x L(ft)/10] ²⁾ | h<75 h≥75 [h<3] per any 5 ft or [1/4 x L (ft)/5] [h≥3] [1/8 x L (ft)/5] | 0,004 L 0,002 L [1/4 inch per any 5 ft or [1/4 x L (ft)/5] [1/8 x L (ft)/5] | 0,002L | 80<h≤180 180<h≤360 h>360 | 0,0030 L 0,0015 L 0,0010 L | |
| | Length Longitud Długość | L (mm) [in.] | -0/+100 ¹⁾ ±50 ³⁾ | -0/+100 ¹⁾ ±50 ³⁾ | -0/+100 ¹⁾ [-0/+4] ¹⁾ | -0/+100 ¹⁾ [-0/+4] ¹⁾ | L≤12000 h<790 L≤12000 h≥790 L≥12000 | +60 +80 +100 | L<7000 7000≤L<15000 L≥15000 | +40 +(40+ 0,005 x (L-7)) +100 | -0/+100 | | |
| Concavity of web Concavidad alma Wygięcie środka | W (mm) | | | | | h≤120 120<h<380 380≤h<680 h>680 | 1,0 1,5 2,0 3,0 | h≤120 120<h<380 380≤h<680 h>680 | 1,0 1,5 2,0 3,0 | | | | |
| Mass / Masa / Masa | G (%) | ±4 | ±4 | G<100lbs/ft: +3,0/-2,5 G≥100lbs/ft: +2,5/-2,5 | G<100lbs/ft: +3,0/-2,5 G≥100lbs/ft: +2,5/-2,5 | | | | ±4 | | ±4 | | ±4 |

¹⁾ When a minimum length is specified.

²⁾ If specified on orders as columns:

L≤14m ; 0,001L (max. 10) ; L>14m 10+0,001x(L-14000)

Only for W200x200, W250x250, W310x310, W360x370, W360x410, HP200x53, HP 250x85, HP 310x110 to 132, HP360x152 & -174

[L≤45ft; 1/8 x L(ft)/10 (max. 3/8)]; [L>45ft: 3/8 + 1/8 x (L(ft)-45)/10]

[only for W8x8, W10x10, W12x12, W14x14,5, W14x16, HP8x36, HP10x57, HP12x74 to 89, HP14x102 & 117]

³⁾ Usual tolerances.

⁴⁾ Other tolerances upon agreement.

¹⁾ Cuando se especifica una longitud mínima.

²⁾ Si en el pedido se especifican como pilares :

L≤14m ; 0,001L (max. 10) ; L>14m 10+0,001x(L-14000)

Sólo para W200x200, W250x250, W310x310, W360x370, W360x410, HP200x53, HP 250x85, HP 310x110 hasta 132, HP360x152 & -174

[L≤45ft; 1/8 x L(ft)/10 (max. 3/8)]; [L>45ft: 3/8 + 1/8 x (L(ft)-45)/10]

[sólo para W8x8, W10x10, W12x12, W14x14,5, W14x16, HP8x36, HP10x57, HP12x74 hasta 89, HP14x102 & 117]

³⁾ Tolerancias habituales.

⁴⁾ Otras tolerancias previo acuerdo.

¹⁾ Kiedy określona jest długość minimalna.

²⁾ Jeżeli wyszczególnione na zamówieniach jako słupy:

L≤14m ; 0,001L (max. 10) ; L>14m 10+0,001x(L-14000)

Tylko dla W200x200, W250x250, W310x310, W360x370, W360x410, HP200x53, HP 250x85, HP 310x110 do 132, HP360x152 & -174

[L≤45ft; 1/8 x L(ft)/10 (max. 3/8)]; [L>45ft: 3/8 + 1/8 x (L(ft)-45)/10]

[tylko dla W8x8, W10x10, W12x12, W14x14,5, W14x16, HP8x36, HP10x57, HP12x74 do 89, HP14x102 & 117]

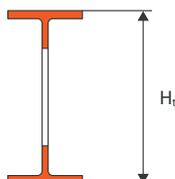
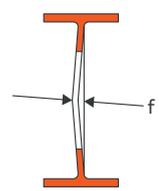
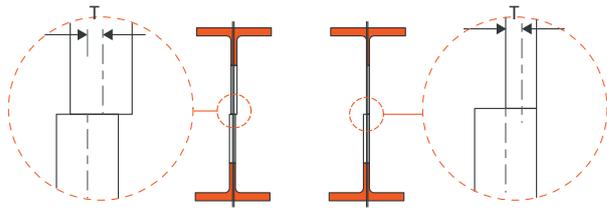
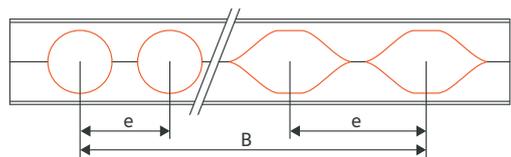
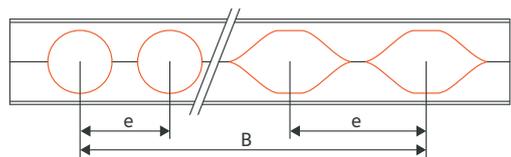
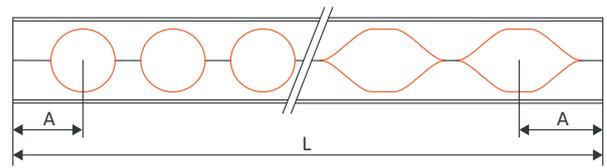
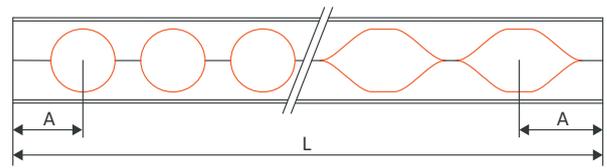
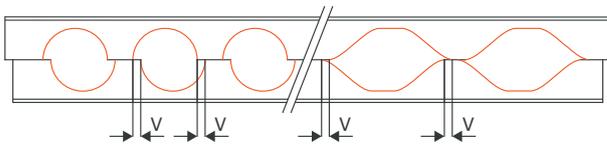
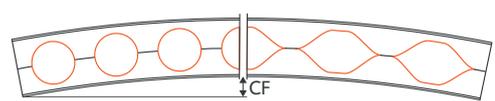
³⁾ Tolerancje zwykłe.

⁴⁾ Inne tolerancje po uzgodnieniu.

Table 15
Tolerances for ACB® and Angelina® beams
 with circular, sinusoidal, hexagonal or octagonal large web openings

Tabla 15
Tolerancias para vigas ACB® y Angelina®
 con alveolos y aberturas circulares, sinusoidales, hexagonales o octogonales

Tabela 15
Tolerancje dla belek ażurowych ACB® i Angelina®
 z okrągłymi, sinusoidalnymi, sześciokątymi lub ośmiobocznymi otworami w środku

| ACB® / Angelina® | | | |
|---|--|--|--|
| Final height Altura final Końcowa wysokość | H_t $H_t < 600$ $600 \leq H_t < 800$ $H_t \geq 800$ | + 3 / - 5 mm + 4 / - 6 mm + 5 / - 7 mm |  |
| Bending of web Plegado del alma Zginanie środka | f $H_t < 600$ $H_t \geq 600$ | $f \leq 4$ mm $f \leq 0,01 H_t$ |  |
| Misalignment of T-sections: (between axis of upper section and axis of lower section) Desalineación de las secciones en T: (entre el eje de la sección superior y el eje de la sección inferior) Przesunięcie teowników: (między osią górnego i dolnego kształownika) | T | $T \leq 2$ mm |  Symmetrical section Sección simétrica Bez płytki wypełniającej Hybrid section sección híbrida sekcja hybrydowa |
| Spacing Distancia Odstęp | e | +/- 0,01 e |  |
| Distance from 1st to last opening Distancia al extremo desde el eje del primer alvéolo Odległość od 1-szego do ostatniego otworu | B | +/- 0,02 e |  |
| Diameter / height Diámetro / altura Średnica / wysokość | a_0 | + 5 / - 2 mm |  |
| Length Longitud Długość | L | +/- 2mm |  |
| Distance of 1st opening from end Distancia al extremo desde el eje del primer alvéolo Odległość 1-szego otworu od końca | A | +/- 0,02 e |  |
| Offset of web posts Ajuste del montante de la sección T Przesunięcie złozenia | V | $V \leq 0,03 \% L$ |  |
| Example Ejemplo Przykład | | if / si / Jeśli $L = 10\ 000$ mm $V \leq 3$ mm | |
| Camber Contraflecha Wypukłość | CF | +/- 0,05 CF CF min. 5 mm |  |

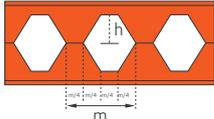
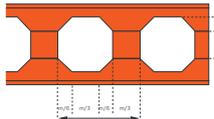
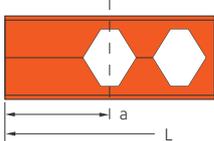
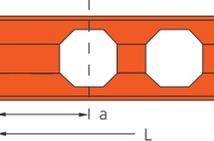
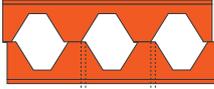
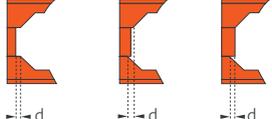
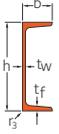
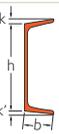
| IPE - HE - HL | Without fillerplate Sin placa de relleno Bez płytki wypełniającej | | | With fillerplate Con placa de relleno Z płytką wypełniającą | | |
|--|---|---|-----------------------------|--|---|-----------------------------|
| Step /Paso /Stopień: m Cut height /Altura de corte/ Wysokość cięcia: h Fillerplate height /Altura de placa de relleno/ Wysokość płytki wypełniającej: h ₁ (mm) |  | m | ±0,01m ±2 |  | m h h ₁ | ±0,01m ±2 ±2 |
| Length / Longitud / Długość (mm) Distance between axis of first opening to end Distancia al extremo desde el eje del primer alvéolo Odległość pomiędzy osią pierwszego otworu do końca a (mm) |  | Milled cut Corte molido Frezowane cięcie Torch cut corte de la antorcha cięcie palnika | ±2 -0/+100 ±5 |  | Milled cut Corte molido Frezowane cięcie Torch cut corte de la antorcha cięcie palnika | ±2 -0/+100 ±5 |
| Gap Ajuste del montante Szczelina d (mm) |  | | ≤2 |  | | ≤2 |
| Post alignment Alineación del montante wyrównanie słupków Δe (mm) |  | | ≤2 |  | | ≤2 |

Table 16
Rolling tolerances - channels & joists

Tabla 16
Tolerancias de laminación - Perfiles en U

Tabela 16
Tolerancje walcownicze - ceowniki i dwuteowniki

| Sections Secciones Sekcje | | UPE, UPN, PFC | | UE | | C MC | | |
|---|---|--|--|--|--|--|--|---|
| | | EN 10279: 2000 | | GOST 8240-97 | | ASTM A 6/A 6M - 16 | | |
| Depth Altura Głębokość |  | h (mm) [in] | h≤65 65<h≤200 200<h≤400 h>400 | ±1,5 ±2 ±3 ±4 | h≤80 80<h≤200 200<h≤400 | ±1,5 ±2 ±3 | 75≤h≤180 [3≤h≤7] 180<h≤360 [7<h≤14] h>360 [h>14] | +3/-2 [+ ³ / ₃₂ /- ¹ / ₁₆] +3/-3 [+ ¹ / ₈ /- ³ / ₃₂] +5/-4 [+ ³ / ₁₆ /- ¹ / ₈] |
| Flange width Anchura de ala Szerokość stopki | | b (mm) [in] | b≤50 50<b≤100 100<b≤125 b>125 | ±1,5 ±2 ±2,5 ±3 | b≤40 40<b≤89 b>89 | ±1,5 ±2 ±3 | 75≤h≤180 [3≤h≤7] 180<h≤360 [7<h≤14] h>360 [h>14] | +3/-3 [+ ¹ / ₈ /- ¹ / ₈] +3/-4 [+ ¹ / ₈ /- ⁵ / ₃₂] +3/-5 [+ ¹ / ₈ /- ³ / ₁₆] |
| Web thickness Espesor de alma Grubość środnika | | t _w (mm) | t _w ≤10 10<t _w ≤15 15<t _w | ±0,5 ±0,7 ±1,0 | t _w ≤5,1 5,1<t _w ≤6,0 6,0<t _w | ±0,5 ±0,6 ±0,7 | | |
| Flange thickness Espesor de ala Grubość stopki | | t _f (mm) | t _f ≤10 10<t _f ≤15 15<t _f | -0,5 ²⁾ -1 ²⁾ -1,5 ²⁾ | t _f ≤10 10<t _f ≤11 11<t _f | -0,5 ²⁾ -0,8 ²⁾ -1,0 ²⁾ | | |
| Heel radius Radio de redondeo Promień zaokrąglenia narożników | | r ₃ (mm) | | ≤0,3t _f | | | | |
| Out-of-square Falta de paralelismo Nierównoległość stopek |  | k (k') (mm) [in] | b≤100 b>100 | k+k'≤2 k+k'≤0,025 b | b≤95 b>95 | k;k'≤1,0 k;k'≤0,015b | | k+k'≤0,03 b [k+k'≤1/32 b] |
| Web deformation Curvatura de alma Deformacja środnika |  | f (mm) | h≤100 100<h≤200 200<h≤400 400<h | ±0,5 ±1 ±1,5 ±1,5 | h≤100 100<h≤200 200<h≤400 | 0,5 1,0 1,5 | | |
| Straightness Rectitud Prostoliniowość |  | q _{yy} /q _{zz} (mm) [in] | q _{zz} h≤150 150<h≤300 300<h q _{yy} h≤150 150<h≤300 300<h | ±0,0030 L ±0,0020 L ±0,0015 L ±0,0050 L ±0,0030 L ±0,0020 L | | | | q _{yy} ≤0,002 L [q _{yy} ≤1/8 x L(ft)/5] |
| Length Longitud Długość | | L (mm) [in] | | -0/+100 ¹⁾ ±50 ³⁾ | | | | -0/+100 ¹⁾ [-0/+4] ¹⁾ |
| Mass / Masa / Masa | | G (%) | h≤125 h>125 | ±6 ±4 | ±6 | | | ±2,5 |

¹⁾ When a minimum length is specified.

²⁾ Plus deviation limited by mass tolerance.

³⁾ Usual tolerances.

¹⁾ Cuando se especifica una longitud mínima.

²⁾ Más desviación limitada por la tolerancia de masa.

³⁾ Tolerancias habituales.

¹⁾ Po określeniu minimalnej długości.

²⁾ Plus odchylenie ograniczone tolerancją masy.

³⁾ Zwykłe tolerancje.

Table 18
Rolling tolerances - Web tailor-made plates

Tabla 18
Tolerancias de laminación - Chapas WTM con ancho a medida

Tabela 18
Tolerancje walcownicze - płaskowniki WTM

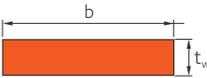
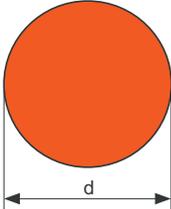
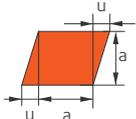
| Products Productos Produkty | | WTM | | |
|---|---------------------|--|---|--|
| Standards / Normas / Normami | | ArcelorMittal Standard | | |
| Width Anchura Szerokość  | b (mm) [in] | $610 \leq b < 900$ [$24 \leq b < 36$] $900 \leq b \leq 1016$ [$36 \leq b \leq 40$] | $-3 / +11$ [-1/8 to 7/16] $-3 / +14$ [-1/8 to 9/16] | |
| | | $t_w = 63,5$ [2.5] $t_w = 69,8$ [2.75] $t_w = 76,2$ [3] $t_w = 88,9$ [3.5] $t_w = 101,6$ [4] | $-0,3 / +2,5$ [-0.01 / +0.09] $-0,3 / +2,5$ [-0.01 / +0.09] $-0,3 / +2,8$ [-0.01 / +0.11] $-0,3 / +3,0$ [-0.01 / +0.11] $-0,3 / +3,5$ [-0.01 / +0.15] | |
| | | $b < 900$ [$b < 36$] $63,5 \leq t_w < 101,6$ [$2.5 \leq t_w < 4$] $t_w = 101,6$ [$t_w = 4$] | 13 [1/2] 14 [9/16] | |
| | | $900 \leq b \leq 1016$ [$36 \leq b \leq 40$] $63,5 \leq t_w < 101,6$ [$2.5 \leq t_w < 4$] $t_w = 101,6$ [$t_w = 4$] | 14 [9/16] 18 [11/16] | |
| Flatness Planicidad Płaskość | (mm) [in] | $63,5 \leq t_w \leq 101,6$ [$2.5 \leq t_w \leq 4$] $b \leq 750$ [$b \leq 30$] $750 < b \leq 1016$ [$30 < b \leq 40$] | $L (mm)/300$ [$3/16 \times L (ft)/5$] $L (mm)/250$ [$1/4 \times L (ft)/5$] | |
| Cambering Contraflechado Gięcie | (mm) [in] | | | |

Table 19
Rolling tolerances - Merchant Bars

Tabla 19
Tolerancias de laminación - Barras comerciales

Tabela 19
Tolerancje walcownicze - pręty walcowane

| Sections Secciones Sekcje | | SQ Square shapes Formas cuadradas Kwadratowe kształty | R Round bars barras redondas Okrągłe pręty |
|--|---|--|---|
| Standards / Normas / Normami | | EN 10059:2003 | EN 10060:2003 |
| Width Ancho Szerokość |  | b (mm) | 35<a≤50 ±0,8 50<a≤90 ±1,0 90<a≤100 ±1,3 100<a≤120 ±1,5 120<a≤150 ±1,8 |
| Thickness / Diameter Espesor / Diámetro Grubość / Średnica |  | a, d (mm) | 10≤d≤15 ±0,4 15<d≤25 ±0,5 25<d≤35 ±0,6 35<d≤50 ±0,8 50<d≤80 ±1,0 80<d≤100 ±1,3 100<d≤120 ±1,5 |
| Out-of-square Falta de paralelismo Nieprostokątność |  | u (mm) | 50<a≤75 ±1,5 75<a≤100 ±2,25 100<a≤150 ±3,0 ±4,5 |
| Straightness Rectitud Prostoliniowość |  | q (mm) | 25<a≤80 0,0040 L 80<a 0,0025 L |
| Heel radius Radio de redondeo Promień zaokrąglenia narożnika |  | r (mm) | 30<a≤50 ≤2,5 50<a≤100 ≤3 a>100 ≤4 AM standard for SQ : 140 ≤a ≤160 +3 / -5 |
| Length Longitud Długość | | L (mm) | ±100 |
| Mass Masa Masa | | G (%) | ±4 |

Conversion table and material coefficients of structural steel

Tabla de conversión y coeficientes del material para acero estructural

Tablica przeliczeniowa i Współczynniki materiałowe stali konstrukcyjnych

| Length/Area/Volume | | Longitud / Área / Volumen | | Długość / Powierzchnia / Objętość | |
|--------------------|---------------------------|---------------------------|--------------------------|-----------------------------------|--|
| 1 mm | = 0,03937 in | 1 in (inch) | = 25,4 mm | | |
| 1 cm | = 0,393701 in | 1 in (inch) | = 2,54 cm | | |
| 1 m | = 3,281 ft | 1 ft (foot) | = 0,3048 m | | |
| 1 cm ² | = 0,1550 in ² | 1 in ² | = 6,452 cm ² | | |
| 1 m ² | = 10,76 ft ² | 1 ft ² | = 0,0929 m ² | | |
| 1 cm ³ | = 0,06102 in ³ | 1 in ³ | = 16,390 cm ³ | | |
| 1 m ³ | = 35,31 ft ³ | 1 ft ³ | = 0,02832 m ³ | | |
| 1 cm ⁴ | = 0,02403 in ⁴ | 1 in ⁴ | = 41,62 cm ⁴ | | |

| Force/Stress | | Fuerza / Tensión | | Siła / naprężenie | |
|-----------------------------|----------------------------|-----------------------------|------------------------------|-------------------|--|
| 1 N | = 0,2248 lbf | 1 lbf (pound-force) | = 4,448 N | | |
| 1 N/m | = 0,06852 lbf/ft | 1 lbf/ft | = 14,59 N/m | | |
| 1 N/mm ² = 1 MPa | = 145 lbf/in ² | 1 lbf/in ² (psi) | = 0,006895 N/mm ² | | |
| 1 N/mm ² = 1 MPa | = 0,145 ksi | 1 ksi | = 6,895 N/mm ² | | |
| 1 N/cm ² | = 1,45 lbf/in ² | 1 lbf/in ² | = 0,6895 N/cm ² | | |

| Moment | | Momento | | Moment | |
|--------|-------------------|------------|-------------|--------|--|
| 1 N m | = 8,851 lbf – in | 1 lbf – in | = 0,113 N m | | |
| 1 N m | = 0,7376 lbf – ft | 1 lbf – ft | = 1,356 N m | | |

| Mass | | Masa | | Masa | |
|------------------|------------------------------|-------------------|-------------------------|------|--|
| kg | = 2,205 lb | 1 lb (pound-mass) | = 0,4536 kg | | |
| 1 tonne (metric) | = 1,102 short ton (2000 lb.) | 1 short ton | = 0,9072 tonne (metric) | | |
| 1 tonne (metric) | = 0,9842 long ton (2240 lb.) | 1 long ton | = 1,016 tonne (metric) | | |
| 1 kg/m | = 0,672 lb/ft | 1 lb/ft | = 1,4882 kg/m | | |

| Temperature | | Temperatura | | Temperatura | |
|--------------|-----------------|-----------------|-------------------|-------------|--|
| °C (Celsius) | = (°F – 32)/1,8 | °F (Fahrenheit) | = (1,8 x °C) + 32 | | |

| Energy | | Energía | | Energia | |
|-------------|-------------------|----------|--------------|---------|--|
| 1 J (Joule) | = 0,737562 ft-lbf | 1 ft-lbf | = 1,355818 J | | |

| α_a Coefficient of linear thermal expansion | α_a Coeficiente de dilatación térmica | α_a Współczynnik liniowej rozszerzalności cieplnej |
|--|--|---|
| $\nu_a = 0,3$ | $\alpha_a = 12 \cdot 10^{-6} \text{ K}^{-1}$ | $\rho_a = 7850 \text{ kg/m}^3$ |

| ν_a Poisson's ratio | ν_a Relación de Poisson | ν_a Współczynnik Poissona |
|--|-----------------------------|-------------------------------|
| ρ_a unit mass | ρ_a unidad de masa | ρ_a masa jednostkowa |
| E_a modulus of elasticity | E_a módulo de elasticidad | E_a moduł sprężystości |
| $E_a = 210000 \text{ N/mm}^2 = 210000 \text{ MPa} = 210 \text{ kN/mm}^2 = 21000 \text{ kN/cm}^2 = 210000 \text{ MN/m}^2$ | | |

| G_a shear modulus | G_a módulo de corte | G_a moduł ścinania |
|---|-----------------------|----------------------|
| $G_a = \frac{E_a}{2(1+\nu_a)}$ $G_a \cong 81000 \text{ N/mm}^2 = 81000 \text{ MPa} = 81 \text{ kN/mm}^2 = 8100 \text{ kN/cm}^2 = 81000 \text{ MN/m}$ | | |

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