



Corus International Projects

www.corusinternational.com

Product range

Care has been taken to ensure that this information is accurate, but Corus Group plc and its subsidiaries does not accept responsibility or liability for errors or information which is found to be misleading.

Copyright 2005
Corus International

Global steel supply and services



Corus International Projects

897 Silbury Boulevard
Central Milton Keynes
Buckinghamshire
MK9 3XJ
United Kingdom

T +44 (0) 1908 508 250
F +44 (0) 1908 508 258

Hampton House
20 Albert Embankment
London
SE1 7TJ
United Kingdom

T +44 (0) 20 7975 8393
F +44 (0) 20 7975 8406

projects@corusgroup.com

Corus is one of the world's biggest steel supplier groups, formed in 1999 by the merger of British Steel and Koninklijke Hoogovens.

Corus manufactures, processes and distributes metal products and provides related services in design, technology and consultancy. Combining international expertise with local service, the **Corus** brand represents a mark of quality and strength.

Corus has the capacity to produce over 21 million tonnes of steel and some half a million tonnes of rolled and extruded aluminium products a year. Net expenditure on research and development amounted to £69 million last year.

Corus employs around 50,000 people worldwide. Our main markets are the Construction, Automotive, Packaging, Engineering, Metal Goods and Oil & Gas industries.

Corus is represented globally by **Corus International**, a wholly-owned business unit. **Corus International Projects** is the dedicated supply chain management division within **Corus** and has a worldwide network of offices, which currently extends across 48 countries. Furthermore, we are continually expanding our office network and evaluating new markets for which a local presence would bring us strategic advantage.

As such, **Corus International Projects** offers bespoke, all inclusive, steel-sourcing solutions covering all of your specialist needs, anywhere in the world and has a proven track record of offering tailored metal solutions to a wide variety of project sectors. **Corus International Projects** is ISO 9000 accredited.

Our in-house logistics teams are experts in consolidating materials from multiple sources, arranging multiple packaging and ensuring that goods arrive on time, in excellent condition and at the desired destinations, wherever that is in the world. These teams regularly manage production, processing, quality assurance, inspection, documentary requirements and customs clearance formalities.

Being a large multinational group, **Corus** can draw on considerable internal resources including technical support, expertise in export finance and currency transactions, and access to one of the world's

most comprehensive ranges of metals, including carbon and alloy steels, stainless steel and aluminium.

Corus International Projects identifies customers' needs and priorities early on. The requests we deal with can cover anything from a simple range of products, supplied as a total package either ex-mill or ex-stock, to a more comprehensive service. In the latter case, the service might consist of a combination of elements with single point contact management, expediting, specialist packaging, shipping, documentation, local "in-country" support and financing – as appropriate. Likewise, there are many demands for other types of packages, which might include requirements for extra processing or value added services with technical expertise and support or complex product and supply mixes, involving multiple sourcing from different locations and countries. The variations are infinite.

All of these elements add up to a complete, managed-supply solution and are all in place to ensure that **Corus** customers receive the best possible advice and support.

It is by combining our expertise and service innovatively and effectively, that we at **Corus** are able to offer our customers a tailored metals solution, whatever the sector, customer or project, wherever in the world.

This publication is intended as a guide to the scope of our offering and the selection of sizes includes the typical, common ranges we have learned from experience as being the most popular. As such, due to the complex nature of steel products, these tables are not exhaustive. Full details of our complete range of specifications are available on request.

1.0 Engineering bar	6		
1.1 Standard bar sections	6		
1.2 Reinforcing products	7		
2.0 Steel sheet and plate	8		
2.1 Continuously rolled hot rolled sheet and plate	8		
2.2 Cold reduced steel sheet and coil	9		
2.3 Metal coated strip products	10		
2.4 Organic coated strip products	12		
2.5 Reversing mill plate	13		
2.6 International grade comparisons	14		
3.0 Offshore steel products	26		
3.1 Offshore products	26		
3.2 Offshore grade comparisons	27		
4.0 Corus building systems	28		
4.1 Cladding systems for roof and wall	28		
4.2 Decking systems for flooring and roofing	30		
4.3 Bi-Steel	32		
5.0 Steel sections	34		
5.1 BS4 sections	34		
5.1.1 Universal beams	34		
5.1.2 Universal columns	36		
5.1.3 Joists	37		
5.1.4 Parallel flange channels	38		
5.1.5 Tapered flange channels	38		
5.1.6 Equal angles	39		
5.1.7 Unequal angles	40		
5.2 European sections	41		
5.2.1 European beams	41		
5.2.2 European standard beams	45		
5.2.3 European parallel flange channels	45		
5.2.4 European tapered flange channels	46		
5.3 American sections	47		
5.3.1 American W-sections	47		
5.3.2 Jumbo sections	54		
5.4 Piling	54		
6.0 Hollow sections	56		
6.1.1 Celsius® hot finished structural hollow sections	56		
6.1.2 Circular hollow sections	60		
6.1.3 Square hollow sections	62		
6.1.4 Rectangular hollow sections	67		
6.1.5 Jumbo rectangular hollow sections	71		
6.1.6 Jumbo square hollow sections	72		
6.1.7 Celsius® ovals	74		
6.2.1 Strongbox and Hybox cold formed structural hollow sections	77		
6.2.2 Cold-formed circular hollow sections	78		
6.2.3 Cold-formed square hollow sections	81		
6.2.4 Cold-formed rectangular hollow sections	84		
7.0 Pipe and tube products	88		
7.1 Carbon steel linepipe and carbon and low alloy steel process pipe	88		
7.2 Stainless and Duplex process pipe	93		
7.3 General purpose tube	95		
7.4 Pipe coatings	97		
8.0 Special profiles	100		
8.1 Special profile products	100		
8.2 Bulb flats	101		
9.0 Notes	104		

1.0 Engineering bar

1.1 Standard bar sections






Corus International Projects can supply a wide range of engineering bar products to suit the needs of today's international market. Products supplied include both black and bright bars, in a wide variety of product forms and sizes, as well as case hardening, free cutting and tool steels. Recognised branded products can be supplied along with materials in accordance with a range of international standards. Bar can be supplied as either cut lengths or in coil form.

Steels produced

- Alloy through-hardening, case-hardening and nitriding steels
- Carbon and carbon manganese steels
- Free machining steels (XLCut & HitenSpeed)
- Lead steels
- Heat treatable steels
- Improved machining steels (IM)
- Micro-alloyed steels (Vanard)
- Fracture splittable steels (Fractim)
- Cold heading steels
- Spring steels
- Stainless steels – austenitic, ferritic, martensitic, duplex and super duplex
- Tool and die steels
- Remelted products

Other Corus brand name steels include:

- High temperature bolting steels (Durehete)
- Stainless and corrosion resistant steels (Silver Fox)
- High temperature (Red Fox) and creep resistant steels (Esshete)
- Aircraft (Jethete) and maraging (Nimar) steels
- Steels can be supplied remelted (ESR, VAR, VIM/VAR)

Type	Dimension		Mass/m				Profile
	Min (mm)	Max (mm)	Min Kg/m	Max Kg/m	Kg/m Equation (C. Steel)	Kg/m Equation (S. Steel)	
Round	6	600	0.22	2219	$M=D(mm)^2 /162.2$	$M=D(mm)^2 /159.2$	
Half Round	50x25	76x38	7.71	17.90	$M=D(mm)^2 /324.4$	$M=D(mm)^2 /318.3$	
Square	8x8	200x200	0.50	314	$M=t(mm)^2 /127.4$	$M=t(mm)^2 /125$	
Rectangular	3x10	450x25	0.26	141.35	$M=t(mm) \times W(mm) /127.4$	$M=t(mm) \times W(mm) /125$	
Hexagonal	7	75	1.00	114.8	$M=W(mm)^2 /49.0$	$M=W(mm)^2 /48.1$	

Type	Typical International Standards Supplied	
Quench & Tempered	EN 10083 Pt 1	BS 970 Pt 3, DIN 17200, AISI 1139 & 1141
Case Hardening	EN 10084	BS 970 Pt 3, DIN 1651, AISI 4037 & 4140
Free Cutting	EN 10087	BS 970 Pt 3, DIN 1651, AISI 1215 & 12L14
Tool Steels	BS 4659	
Others	EN 10025	ASTM A193

1.2 Reinforcing products

Corus International Projects can supply a wide variety of reinforcing products including Re-bar, D-bar and reinforcing mesh for the construction industry, in accordance with common international specifications such as BS 4449, DIN 488 and ASTM A615. The bar materials can be supplied either plain or ribbed, see diagram, and in the following product forms as; cut length, bar-in-coil, or formed as requested.

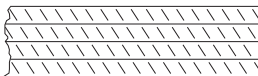


Figure 1 – Example of rib pattern of grade 460A with four transverse rib series

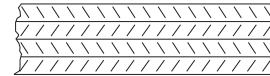


Figure 2 – Example of rib pattern of grade 460B with four transverse rib series

2.0 Steel sheet and plate

2.1 Continuously rolled hot rolled sheet and plate

The thinner gauges of hot rolled strip are produced on continuous wide strip mills. They are coiled up after rolling and when cold they are cut up into sheets (< 3mm) or plates (≥ 3mm).

In terms of thickness, there is considerable overlap between the products of reversing mills and strip mills, but the former benefits from having the capability of rolling very much wider than a strip mill. On the other hand, the strip mill product is characterised by a better surface finish and improved control of thickness.

Standard thicknesses (mm), with corresponding mass per unit area values (kg/m²), are shown in the following table:

Thickness (mm)	1.6	2.0	2.5	3.0	4.0	5.0
Mass (kg/m ²)	12.6	15.7	19.6	23.6	31.4	39.6
Thickness (mm)	6.0	8.0	10.0	12.5	15.0	20.0
Mass (kg/m ²)	47	63	79	98	118	157

Durbar floor plates

Durbar is a non-slip raised pattern floor plate of integral manufacture, i.e. the pattern is rolled in – not welded. The studs are distributed to give maximum slip resistance from any angle whilst ensuring a free draining surface.

The nominal gauge of Durbar is the thickness of the plain plate exclusive of pattern. The stud height varies with the plate dimensions and grade, being typically within the overall range 1.5 – 2.2mm. Durbar is available commonly in commercial quality material, as EN 10025-2 S275JR or as Lloyds Grade 'A'.

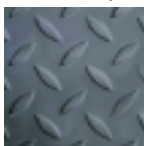
Thicknesses, with the corresponding mass per unit area are as follows:

Thickness (mm) (on plain)	3	4.5	6	8
Mass per unit area (kg/m ²)	26.19	36.9	48.7	64.4

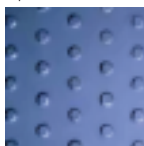
Common floor plate designs

In accordance with American and European standards such as ASTM A786

Durbar/teardrop



Spot



Bar



2.2 Cold reduced steel sheet and coil

The normal cut-off point for hot rolled products is around 1.5mm thick. Customers requiring thinner material should buy a cold reduced product. While this is more expensive it offers significant benefits; the surface is far superior, as is the dimensional control, especially thickness. Nevertheless, in pure dimensional terms, there is an area of overlap between hot rolled and cold reduced products of approximately 1.5mm, between about 1.5mm and 3.0mm.

Standard formable cold reduced products are manufactured to the European standard EN 10130, which replaced BS 1449. CR products are available in grades from DC01A to DC06A

Structural 'mild steel' sheets to EN 10130. Cold rolled products are available in a variety of standard sizes in thicknesses from 0.4mm to 3.0mm.

Standard Coil Dimensions and tolerances in accordance with BS EN 10051, supplied either mill edge or trimmed.

Internal diameter: 610/762mm

Outside diameter: 2100mm (max)

Width: 750-2000mm

Standard thicknesses (mm), with corresponding mass per unit area values (kg/m²) are shown in the following table:

Thickness (mm)	0.4	0.6	0.8	0.9	1.0	1.2
Mass (kg/m ²)	3.14	4.71	6.28	7.07	7.85	9.42
Thickness (mm)	1.25	1.5	1.6	2.0	2.5	3.0
Mass (kg/m ²)	9.62	11.78	12.56	15.70	19.63	23.55

2.3 Metal coated strip products

Corus International Projects can supply a wide range of hot dipped and electrolytic coated steels, in materials such as Zinc (Z), Zinc-Iron (ZF), Aluminium-Zinc (AZ), Zinc-Aluminium (ZA), Aluminium-Silicon (AS) and Lead (Terne) (T). The following coating weights are available as standard:

Hot dipped products fall under the following standards:

EN 10327

Zinc & Zinc-Iron Coatings for Low Carbon Steel Strip
Zinc-Aluminium & Aluminium-Zinc Coatings for Low Carbon Steel Strip
Aluminium-Silicon Coatings for Low Carbon Steel Strip

EN 10326

Zinc & Zinc-Iron Coatings for Structural Steel Strip
Zinc-Aluminium & Aluminium-Zinc Coatings for Structural Steel Strip
Aluminium-Silicon Coatings for Structural Steel Strip

Hot dipped products are usually designated according to their coating weight, e.g. 'Z100' would be Zinc coated steel with 100 g/m², similarly 'ZF140' would describe a Zinc-Iron coating of 140 g/m². In accordance with British and European standards, the hot dipped coating weights range from 50 to 350 g/m². These materials are supplied with tolerances in accordance with EN 10143.

The Corus proprietary grades for Zinc and Zinc-Iron are Galvalite, Aluminium-Zinc is Galvalloy (95%Zn/5% Al), Aluminium-Silicon is Aludip. Neotec™ is a lead free metallic coated steel, designed to help evaporation emissions from fuel tanks and meet recycling targets. This product is environmentally friendly and a cost effective solution to help meet ELV targets and reduce end-of-life recycling costs.

Electrolytic Coated products:

These products are typically designated by their nominal thickness.

These are typically supplied as electrolytic Zinc (ZE) or Zinc-Nickel (ZN), which is supplied under the trade name Nizec.

EN 10202

Electrolytic tinplate and electrolytic chromium/chromium oxide coated steel.

EN 10271

Designation	Nominal Coating mass (g/m ²) [each surface]	Nominal Coating thickness (µm) [each surface]
ZN20/20	15	2.0
ZN30/30	22	3.0
ZN40/40	29	4.0
ZN50/50	36	5.0
ZN60/60	44	6.0

EN 10152

Designation	Nominal Coating mass (g/m ²) [each surface]	Nominal Coating thickness (µm) [each surface]
ZE25/25	18	2.5
ZE50/50	36	5.0
ZE75/75	54	7.5
ZE100/100	72	10.0

2.4 Organic coated strip product

For over 30 years Corus has manufactured a range of organic coated metals, these products are based on either Aluminium or Steel substrates and are coated in a variety of organic materials such as fluorocarbons, polyesters, and polyurethanes. These materials are available in a variety of colours, offer excellent durability and can be covered by a series of written guarantees.

The Corus product range includes:

Colorcoat® Versashield™	A high build product offering an excellent performance for harsh African, Middle and Far Eastern climates. <ul style="list-style-type: none"> • 100µm high performance coating offering excellent UV light and abrasion resistance. • Galvatite® substrate to EN 10147 with a zinc metallic coating offering good corrosion resistance. • High performance reverse side backing coat.
HPS200	A high build, high durability organic coated on a Zinc/Aluminium galvanised substrate, available in a wide range of colours.
Celestia	An organic coated, zinc galvanised material; available in a series of metallic finishes.
PVDF®	A high durability organic coated product, designed for high UV environments, available on galvanised steel, stainless steel or aluminium substrates.
Architectural Polyester/ Silicone Polyester	A low cost organic coated product, based on a Zinc galvanised substrate.
Pastel Line Enamel	A galvanised internal lining material, offering high levels of reflectivity.
Assure™	An organic coated product with an anti-bacterial finish, designed for food preparation & clean room environments.
Colorcoat Armacor®	A multi-layer polyurethane coated product available with performance guarantees.
Colorfarm®/Ruralclad	An organic coated product with extra thick zinc galvanisation, designed for high humidity environments.

2.5 Reversing mill plate

Corus International Projects can offer a comprehensive range of reversing mill plate, in a variety of grades and sizes suitable for a wide selection of applications. This includes structural grades suitable for general fabrication and engineering purposes, dedicated grades for pipe making and ship building, as well as fired and unfired pressure vessel plate. In addition, we can offer materials with high surface hardness, suitable for applications where wear resistance is a requirement. Typical examples of the grades offered are:

Structural

EN 10025:2004	S275JR, JO & J2 – Mild Steel S355JR, JO & J2 – High Yield
---------------	--

ASTM A36	
ASTM A283	Grades A – D

Pipe Making

API-5L	Grades A, B, X42, X46, X52, X60, X65, X70
--------	---

Ship Building

In accordance with: Lloyds Register, DNV, GL and ABS
Grades: A, B, D & E; AH32 & AH36

Pressure Vessel

EN 10028:2003	Part 2: P235GH – P355GH Elevated Temperature Properties
	Part 3: P355NH – P460 NL2 Weldable Fine Grained

ASTM A516	Grade 60 & 70
ASTM A537	Class 1 & 2

Wear Resistance

Abrazo	160	EN 10083-1:1991 C30E
	180	EN 10083-1:1991 C40E
	200	EN 10083-1:1991 C55E

Plates can be supplied in a wide variety of sizes, dependent on grade, typical ranges are described below:

Width:	1000mm – 4000mm
Length:	4000mm – 12000mm
Thickness:	6mm – 300mm

2.6 International grade comparisons

Revised European	European	British	German	
EN10025 Part 2: 2004	EN10025: 1993	BS4360	DIN 17100	Werkstoff
	S185	-	St33	1.0035
S235 JR	S235 JR(G2)	40(A) B	RSt37-2	1.0038
S235 J0	S235 J0	40C	St37-3U	1.0114
S235 J2 (+N)	S235 J2G3	40D	St37-3 N	1.0116
S235 J2	S235 J2G4	40EE	-	1.0117
S275 JR	S275 JR	43(A) B	St44-2	1.0044
S275 J0	S275 J0	43C	St44-3U	1.0143
S275 J2 (+N)	S275 J2G3	43D	St44-3N	1.0144
S275 J2	S275 J2G4	43EE	-	1.0145
S355 JR	S355 JR	50B	-	1.0045
S355 J0	S355 J0	50C	St52-3 U	1.0553
S355 J2 (+N)	S355 J2G3	50D	St52-3 N	1.0570
S355 J2	S355 J2G4	-	-	1.0577
S355 K2 (+N)	S355 K2G3	50DD	-	1.0595
S355 K2	S355 K2G4	50EE	-	1.0596
S450 J0	-	55C	-	1.0590
E295	E295	-	St50-2	1.0050
E335	E335	-	St60-2	1.0060
E360	E360	-	St70-2	1.0070

French	American	Japanese	Russian	International
NFA 35-501	ASTM	SAE	JIS 3106	GOST 535 ISO 630
A33	A283 A,B,C,D	-	-	ST0 Fe310
E24-2	A284 Gr. C, D	1015	SM400A	ST3KP-2 Fe360 B
E 24-3	-	-	SM400B	ST3PS-2 Fe360C
E24-4	A284 Gr. D	-	SM400C	ST3PS-4 Fe360 D
-	A 36	-	-	ST3SP-4 -
E28-2	A529 Gr. 42,50	1020	-	- Fe430B
E28-3	A572 Gr. 42	-	-	ST4PS Fe430C
E28-4	A572 Gr. 42,50	-	-	- Fe430D
-	-	-	-	ST4PS -
E36-2	A633 Gr. A,C,D	-	SM490A	- Fe510 B
E36-3	A572 Gr. 50	-	SM490B	- Fe510 C
E36-3	A572 Gr. 50	1024	SM490 C	17GS Fe510D
A52 FP	A656 Gr. 50	-	SM490 YA	-
E36-4	-	-	SM490 YB	-
-	-	-	-	-
-	-	-	-	-
A50-2	-	-	-	-
A60-2	-	-	-	-
A70-2	-	-	-	-

These comparison tables are only intended as an indication of the closest known equivalent grades. The source standards should always be checked for the specific purpose for each material, in case of doubt.

2.6 International grade comparisons

Structural fine grained steel equivalents

Revised European	European	British	German	
EN10025 Part 3: 2004	EN10113-2	BS4360	DIN 17102	Werkstoff
S275N	S275N	43DD	StE285	1.0486
S275NL	S275NL	43EE	TStE285	1.0488
S355N	S355N	50DD	StE355	1.0562
S355NL	S355NL	50EE	TStE355	1.0566
S420N	S420N	-	StE420	1.8902
S420NL	S420NL	-	TStE420	1.8912
S460N	S460N	55C	StE460	1.8905
S460NL	S460NL	55EE	TStE460	1.8915

French	American	Japanese	Russian	International
NFA 36-201	ASTM	JIS 3106	GOST 19281	ISO 4950 T.2
-	-	SM400B	-	-
-	A633 A	-	-	-
E355 R	-	SM490B	15 GF	E355
E355 FP	A633 C	-	-	E355E
E420 R	-	SM490C	16G2AF	E420
E420 FP	A633 E	-	-	-
E460 R	-	SM520B	18G2AF	E460
E460 FP	-	-	-	-

Thermo-mechanically control rolled (TMCR) steel equivalents

Revised European	European	British	German	
EN10025 Part 4: 2004	EN10113-3	BS4360	DIN 17102	Werkstoff
S275M	S275M	-	StE285 TM	1.8818
S275ML	S275ML	-	TStE285 TM	1.8819
S355M	S355M	-	StE355 TM	1.8823
S355ML	S355ML	50EE	TStE355 TM	1.8834
S420M	S420M	-	StE420 TM	1.8825
S420ML	S420ML	-	TStE420 TM	1.8836
xS460M	S460M	-	StE460 TM	1.8827
S460ML	S460ML	55EE	TStE460 TM	1.8838

French	American
NFA 36-201	ASTM
-	-
-	-
E355 R	-
E355 FP	A945 Gr.50
E420 R	-
E420 FP	A945 Gr.60
E460 R	-
E460 FP	-

These comparison tables are only intended as an indication of the closest known equivalent grades. The source standards should always be checked for the specific purpose for each material, in case of doubt.

2.6 International grade comparisons

Weathering steel equivalents

Revised European	European	British	German	
EN10025 Part 5: 2004	EN10155	BS4360	DIN 17119	Werkstoff
S235J0W	S235J0W	WR40B	-	1.8958
S235J2W	S235J2W	-	WTSt 37-3	1.8961
S355 J0WP	S355 J0WP	WR50A	-	1.8945
S355 J2WP	S355 J2WP	-	-	1.8946
S355J0W	S355J0W	WR50B	-	1.8959
S355J2W (+N)	S355J2G1W	-	-	1.8963
S355J2W	S355J2G2W	WR50C	WTSt 52-3	1.8965
S355K2W (+N)	S355K2G1W	-	-	1.8966
S355K2W	S355K2G2W	-	-	1.8967

Heat treatable steel equivalents

Revised European	European	British	German	
EN10025 Part 6: 2004	EN10137-2	BS4360	DIN SEW090	Werkstoff
S460Q	S460Q	-	-	1.8908
S460QL	S460QL	55F	TStE 460V	1.8906
S460QL1	S460QL1	-	-	1.8916
S500Q	S500Q	-	StE 500V	1.8924
S500QL	S500QL	-	TStE 500V	1.8909
S500QL1	S500QL1	-	ESTe 500V	1.8984
S550Q	S550Q	-	StE 550V	1.8904
S550QL	S550QL	-	TStE 550V	1.8926
S550QL1	S550QL1	-	ESTe 550V	1.8986
S620Q	S620Q	-	StE 620V	1.8914
S620QL	S620QL	-	TStE 620V	1.8927
S620QL1	S620QL1	-	ESTe 620V	1.8987
S690Q	S690Q	-	StE 690V	1.8931
S690QL	S690QL	-	TStE 690V	1.8928
S690QL1	S690QL1	-	ESTe 690V	1.8988
S890Q	S890Q	-	-	1.8940
S890QL	S890QL	-	TStE 890V	1.8983
S890QL1	S890QL1	-	ESTe 890V	1.8925
S960Q	S960Q	-	-	1.8941
S960QL	S960QL	-	TStE 960V	1.8933

These comparison tables are only intended as an indication of the closest known equivalent grades. The source standards should always be checked for the specific purpose for each material, in case of doubt.

French	American	Japanese	Russian	International
NF A35-502	ASTM	JIS 3114	GOST 14637	ISO 4952
E24W-3	-	-	-	-
E24W-4	-	SMA 490CW	-	-
E36W-A3	-	-	-	-
E36W-A4	-	-	-	-
E36W-B3	A709 50W	-	17G1S	Fe 355W
-	-	SMA 570W	-	-
-	A709 50W	-	-	-
E36W-B4	-	-	-	-
-	A709 50W	-	-	-

French	American	Japanese	International
NF A36-204	ASTM	JIS 3106	ISO 4950 T3
E460T R	A537 A2	SM 58	-
E460T FP	-	-	E460
-	-	-	-
E500T R	-	-	-
E500T FP	-	-	E500
-	-	-	-
E550T R	-	-	-
E550T FP	-	-	E550
-	-	-	-
E620T R	-	-	-
E620T FP	-	-	E620
-	-	-	-
E690T R	A514 F	-	-
E690T FP	A709 100	-	E690
-	-	-	-
-	-	-	-
-	-	-	-
E960 T-11	-	-	-

2.6 International grade comparisons

Quench & tempered steel equivalents

European	British	German		French
EN10083-1	BS970-3	DIN 17200	Werkstoff	NFA 33101
C22E	070M20	ck 22	1.1151	XC18
C22R	-	cm22	1.1149	XC18u
C25E	070M26	ck25	1.1158	XC25
C25R	-	cm25	1.1163	XC25u
C30E	080M30	ck30	1.1178	XC32
C30R	-	cm30	1.1179	XC32u
C35E	080M36	ck35	1.1181	XC38H1
C35R	-	cm35	1.1180	XC38H1u
C40E	080M40	ck40	1.1186	XC42H1
C40R	-	cm40	1.1189	XC42H1u
C45E	080M46	ck45	1.1191	XC48H1
C45R	-	cm45	1.1201	XC48H1u
C50E	080M50	ck50	1.1206	-
C50R	-	cm50	1.1241	-
C55E	070M55	ck55	1.1203	XC55H1
C55R	-	cm55	1.1209	XC55H1u
C60E	070M60	ck60	1.1221	-
C60R	-	cm60	1.1223	-
28Mn6	150M19	28Mn6	1.1170	-
38Cr2	-	38Cr2	1.7003	38C2
38CrS2	-	38CrS2	1.7023	38C2u
46Cr2	-	46Cr2	1.7006	-
46CrS2	-	46CrS2	1.7025	-
34Cr4	530M32	34Cr4	1.7033	32C4
34CrS4	-	34CrS4	1.7037	32C4u
37Cr4	530M36	37Cr4	1.7034	38C4
37CrS4	-	37CrS4	1.7038	38C4u
41Cr4	530M40	41Cr4	1.7035	42C4
41CrS4	-	41CrS4	1.7039	42C4u
25CrMo4	708M25	25CrMo4	1.7218	25CD4
25CrMoS4	-	25CrMoS4	1.7213	25CD4u
34CrMo4	708M32	34CrMo4	1.7220	34CD4
34CrMoS4	-	34CrMoS4	1.7226	34CD4u
42CrMo4	708M40	42CrMo4	1.7225	42CD4
42CrMoS4	-	42CrMoS4	1.7227	42CD4u
50CrMo4	708M50	50CrMo4	1.7228	-
36CrNiMo4	817M37	36CrNiMo4	1.6511	-

These comparison tables are only intended as an indication of the closest known equivalent grades. The source standards should always be checked for the specific purpose for each material, in case of doubt.

American	Japanese	Russian	International
SAE	JIS G4051	GOST 1050	ISO 683
1020	S20C	20	-
-	-	-	-
-	S25C	25	C25E4 C25M2
-	-	-	-
-	S30C	30	C30E4 C30M2
-	-	-	-
1035	S35C	35	C35E4 C35M2
-	-	-	-
1040	S40C	40	C40E4 C40M2
-	-	-	-
1045	S45C	45	C45E4 C45M2
-	-	-	-
-	S50C	50	C50E4 C50M2
-	-	-	-
1055	S55C	55	C55E4 C55M2
-	-	-	-
-	S58C	60	C60E4 C60M2
-	-	-	-
1527	-	-	28Mn6
-	-	-	-
-	-	-	-
-	JIS G4104	GOST 4543	-
-	SCr430H	35H	34Cr4 34CrS4
-	-	-	-
-	SCr435H	-	37Cr4 37CrS4
-	-	-	-
-	SCr440H	40H	41Cr4 41CrS4
-	-	-	-
-	SCM420	20HM	25CrMo4 25CrMoS4
-	-	-	-
-	SCM435H	35HML	34CrMo4 34CrMoS4
-	-	-	-
4142	SCM440H	38HM	42CrMo4 42CrMoS4
-	-	-	-
-	-	-	50CrMo4
-	-	-	36CrNiMo4

2.6 International grade comparisons

Quench & tempered steel equivalents cont...

European	British	German		French
EN10083-1	BS970-3	DIN 17200	Werkstoff	NFA 33101
34CrNiMo6	817M40	34CrNiMo6	1.6582	-
30CrNiMo8	823M30	30CrNiMo8	1.6580	30CND8
36NiCrMo16	835M30	-	1.6773	35NCD16
51CrV4	735A50	50CrV4	1.8159	50CV4

European	British	German		French
EN10083-2	BS970-1	DIN 17204	Werkstoff	NFA 33101
C22	-	C22	1.0402	-
C25	-	C25	1.0406	-
C30	En5	C30	1.0528	AF50C30
C35	-	C35	1.0501	AF55C35
C40	En8	C40	1.0511	AF60C40
C45	-	C45	1.0503	AF65C45
C50	-	C50	1.0540	-
C55	En9	C55	1.0535	AF70C50
C60	-	C60	1.0601	-

Hot rolled low carbon steel equivalents (for cold forming)

European	British	German		French
EN10111	BS1449	DIN 1614	Werkstoff	NFA 36-301
DD11	HR3	STW 22	1.0332	1C
DD12	HR2	STW23	1.0398	-
DD13	HR1	STW 24	1.0335	3C
DD14	-	-	1.0389	-

American	Japanese	Russian	International
SAE	JIS G4051	GOST 1050	ISO 683
4340	SNCM447	38H2N2MA	36CrNiMo6
-	SNCM431	-	31CrNiMo8
-	-	-	-
50C4V2	SUP10	50HGFA	51CrV4

American	Japanese	Russian	International
SAE	JIS G4051	GOST 1050	ISO 683
-	S20C	20	-
-	-	-	C25
-	-	-	C30
1035	S35C	35	C35
-	-	-	C40
-	S45C	45	C45
-	S50C	50	C50
-	S55C	55	C55
-	S58C	60	C60

These comparison tables are only intended as an indication of the closest known equivalent grades. The source standards should always be checked for the specific purpose for each material, in case of doubt.

2.6 International grade comparisons

Cold rolled low carbon steel equivalents (for cold forming)

European	British	German	French
EN10130	BS1449	DIN 1623	Werkstoff NFA 36-401
DC01	CR4	St12	1.0330 C
DC03	CR3	St13	1.0347 E
DC04	CR1	RRSt14	1.0338 ES
DC05	-	-	1.0312 -
DC06	-	-	1.0873 -

American	Japanese	Russian	International
ASTM 1008	JIS G3141	GOST 380	ISO 6932
CS	SPCC	-	CR22
DS	SPCD	08Ju	-
DDS	SPCE	08Ju	CR24
-	-	-	-
EDDS	-	-	-

Hot rolled high strength low alloy steel equivalents (flat products)

European	British	German	French
EN10149	BS1449	DIN SEW092	Werkstoff NFA 36-231
S315MC	43F30	QStE300TM	1.0972 E315D
S355MC	46F35	QStE360TM	1.0976 E355D
S420MC	-	-	1.0980 -
S460MC	50F45	QStE460TM	1.0982 E445D
S500MC	-	QStE500TM	1.0984 E490D
S550MC	60F45	QStE550TM	1.0986 E560D
S600MC	68F62	-	1.8969 E620D
S650MC	-	-	1.8967 -
S700MC	-	QstE690TM	1.8974 E690D

American	Japanese	International
ASTM A656	JIS G3134	ISO 6930
045 XLK	SPFH 490	-
Gr. 50	SPFH 540	Fe E355
Gr. 60	SPFH 590	Fe E420
Gr. 65	-	-
Gr. 70	-	Fe E490
Gr. 80	-	Fe E560
-	-	-
-	-	-

Cold rolled high strength low alloy steel equivalents (flat products)

European	British	German	French
EN10268	BS1449	DIN SEW093	Werkstoff NFA 36-232
H240LA	-	ZStE 260	1.0480 E240C
H280LA	-	ZStE 300	1.0489 E280C
H320LA	-	ZStE 340	1.0548 E315C
H360LA	-	ZStE 380	1.0550 E355C
H400LA	-	ZStE 420	1.0556 -

American	Japanese
ASTM A1008	JIS G3135
-	SPFC 390
Gr. 45	SPFC 440
Gr. 50	SPFC 490
Gr. 55	SPFC 540
Gr. 60	SPFC 590

These comparison tables are only intended as an indication of the closest known equivalent grades. The source standards should always be checked for the specific purpose for each material, in case of doubt.

3.0 Offshore steel products

3.1 Offshore products

Corus is a leading supplier of offshore plate and structural sections. We have delivered over 2,000,000 tonnes to locations throughout the world and have developed an enviable reputation for our offshore products and technology over the last quarter of a century. Our experience has grown from the North Sea, but in recent years we have expanded to supply steel products to most oil and gas bearing regions of the world.

Product range

Corus International Projects can provide a comprehensive range of offshore structural plates and sections, as well as structural tubulars, seamless and SAW welded pipe, gratings and handrails. These products are available according to Offshore Specifications BS7191, EN 10225, and API grades as well as a variety of other international and proprietary specifications including ship plate grades, approved by all the major classification societies such as Lloyds Register, ABS, BV, DNV and many others.

Bulb flats, used for plate stiffening, in both onshore and offshore fabrication applications. An example range of sizes is shown in section 8.

Plate and section processing

Corus International Projects offers an extensive range of plate and section fabricating and processing, including can rolling, welding, shotblasting, priming, beveling, cutting, profiling and drilling. We would be pleased to discuss your individual requirements in order to build a package to suit your project.

Plate sizes

Gauges from 6mm to 150mm.

Section sizes

Full range of European, ASTM W-section as well as BS4 sizes are available on request. For detail on the available sizes, see Section 5.

Stock plate

Steel grade EN 10225 S355 G10/BS 7191 355EMZ

Typical current size range (in mm)

10 x 3050 x 12000	25 x 3050 x 12000
12.5 x 3050 x 12000	30 x 3050 x 12000
15 x 3050 x 12000	40 x 3050 x 12000
20 x 3050 x 12000	50 x 3050 x 8000'

These comparison tables (opposite) are only intended as an indication of the closest known equivalent grades. The source standards should always be checked for the specific purpose for each material, in case of doubt.

3.2 Offshore grade comparisons

Offshore Structural Steel Equivalents

European	British	German	Norwegian	American
Plates & Tubulars				
EN10225	BS7191	Werkstoff	Norsok M-120	API
S355G2+N	355D	1.8801+N	-	-
S355G3+N	355E	1.8802+N	-	-
S355G5+M	355D	1.8804+M	-	-
S355G6+M	355E	1.8805+M	-	-
S355G7+N	355EM	1.8808+N	-	2H Gr. 50
S355G7+M	355EM	1.8808+M	-	2W Gr. 50/50T
S355G8+N	355EMZ	1.8810+N	Y21 S355N3	2H Gr. 50
S355G8+M	355EMZ	1.8810+M	Y21 S355M3	2W Gr. 50/50T
S355G9+N	-	1.8811+N	Y25 S355N4	-
S355G9+M	-	1.8811+M	Y25 S355M4	-
S355G10+N	-	1.8813+N	Y20 S355N4z	-
S355G10+M	-	1.8813+M	Y20 S355M4z	-
<hr/>				
S420G1+Q	-	1.8830+Q	Y35 S420Q3	2Y Gr. 60
S420G1+M	-	1.8830+M	Y35 S420M3	2W Gr. 60
S420G2+Q	-	1.8857+Q	Y30 S420Q3z	2Y Gr. 60
S420G2+M	-	1.8857+M	Y30 S420M3z	2W Gr. 60
<hr/>				
S460G1+Q	450EM	1.8878+Q	Y45 S460Q3	2Y Gr. 60
S460G1+M	450EM	1.8878+M	Y45 S460M3	2W Gr. 60
S460G2+Q	450EMZ	1.8887+Q	Y40 S460Q3z	2Y Gr. 60
S460G2+M	450EMZ	1.8887+M	Y40 S460M3z	2W Gr. 60
<hr/>				
Sections				
EN10225	BS7191	Werkstoff	Norsok M-120	API
S355G1 (+N)	355D	1.8814(+N)	Y03 S355N1	-
S355G4 (+M)	355D	1.8803(+M)	-	-
S355G11	355EM	1.8806	-	-
S355G11+N	355EM	1.8806+N	Y26 S355N3	2H Gr. 50
S355G11+M	355EM	1.8806+M	Y26 S355M3	2W Gr. 50/50T
S355G12	355EMZ	1.8809	-	-
S355G12+N	355EMZ	1.8809+N	Y21 S355N3	2H Gr. 50
S355G12+M	355EMZ	1.8809+M	Y21 S355M3	2W Gr. 50/50T
<hr/>				
S420G3	-	1.8851	-	-
S420G3+M	-	1.8851+M	Y36 S420M3	2W Gr. 60
S420G4	-	1.8859	-	-
S420G4+M	-	1.8859+M	Y31 S420M3z	2W Gr. 60
<hr/>				
S460G3	-	1.8883	-	-
S460G3+M	-	1.8883+M	Y46 S460M3	2W Gr. 60
S460G4	-	1.8889	-	-
S460G4+M	-	1.8889+M	Y41 S460M3z	2W Gr. 60

4.0 Corus building systems

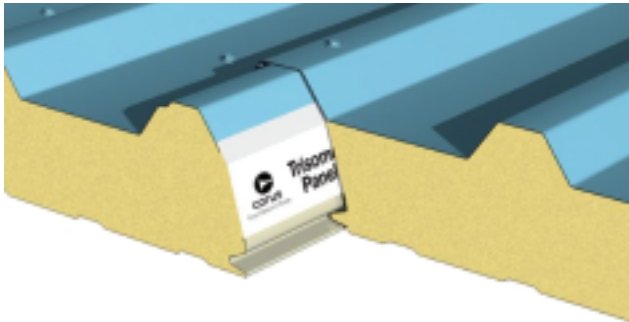
4.1 Cladding systems for roofing and walls

Corus International Projects provides metal based building envelope and flooring systems based on a wide range of profile cladding, decking, composite panel and light steel framing solutions. The range of products is extensive, so please contact us for further details.

Roofing & Cladding Products

Corus produces both sheet roofing panels and composite panels, from steel, stainless steel and aluminium substrates, in a variety of sizes to suit the customer.

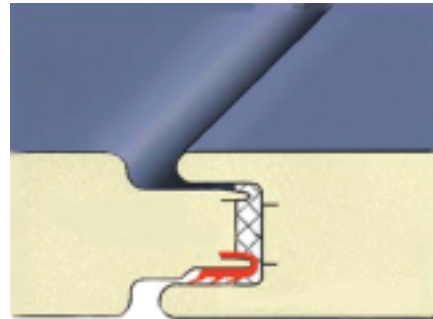
- Stratabord: A high quality, insulated façade system, available in a variety of colours and finishes.
- Trisomet: A PU composite panel, with integral insulation, available on either steel or aluminium substrates in a variety of colours and finishes.



Trisomet panel

Wall Cladding

- Formawall: A superior, flat finished composite wall panel designed to maximise visual impact.
- Trimawall: An economic, flat finished composite panel, available on either steel or aluminium substrates in a variety of colours and finishes.
- Trimapanel: A micro-ribbed insulated panel available on steel or aluminium substrate.
- Trisomet: A PU composite panel, with integral insulation, available on either steel or aluminium substrates in a variety of colours and finishes.
- Guardian: A fire resistant composite panel, LPC approved to 1 hour.
- FischerTherm: A standard composite panel with a rigid PU foam core and additional joint insulation strips to minimise thermal loss within the joint.



FischerTherm panel

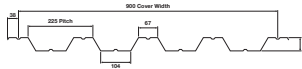
4.2 Decking systems for flooring and roofing

Comflor

A composite deck flooring solution consisting of a zinc-coated, steel tray system, reinforced concrete slab and integrated shear connectors. This product is available in a variety of profiles over a wide range of depth profiles, offering optimum performance in span capacity, economy, composite performance and concrete usage.

Comflor 46

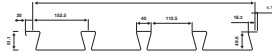
Section Properties (per metre width)



Nominal thickness (mm)	Design thickness (mm)	Profile weight (kN/m ²)	Area of steel (mm ² /m)	Height to neutral axis (mm)	Moment of inertia (cm ⁴ /m)	Ultimate moment capacity (kNm/m)	
						Sagging	Hogging
0.9	0.86	0.09	1137	20.38	41.5	4.63	4.67
1.2	1.16	0.13	1534	20.44	53	5.99	6.23

Comflor 51

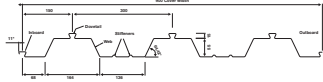
Section Properties (per metre width)



Nominal thickness (mm)	Design thickness (mm)	Profile weight (kN/m ²)	Area of steel (mm ² /m)	Height to neutral axis (mm)	Moment of inertia (cm ⁴ /m)	Ultimate moment capacity (kNm/m)	
						Sagging	Hogging
0.9	0.86	0.13	1579	16.74	55.7	5.69	6.99
1	0.96	0.14	1759	16.73	62.1	6.34	7.93
1.1	1.06	0.16	1938	16.73	68.5	7	8.88
1.2	1.16	0.17	2118	16.72	74.9	7.65	9.81

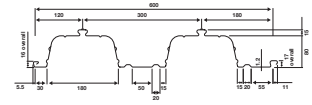
Comflor 70

Section Properties (per metre width)



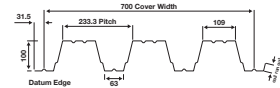
Nominal thickness (mm)	Design thickness (mm)	Profile weight (kN/m ²)	Area of steel (mm ² /m)	Height to neutral axis (mm)	Moment of inertia (cm ⁴ /m)	Ultimate moment capacity (kNm/m)	
						Sagging	Hogging
0.9	0.86	0.1	1178	30.34	54.8	6.18	6.18
1	0.96	0.11	1312	30.33	61.8	7.94	7.94
1.1	1.06	0.12	1445	30.33	68.8	9.7	9.7
1.2	1.16	0.13	1578	30.32	76	11.48	11.48

Comflor 80



Nominal thickness (mm)	Design thickness (mm)	Profile weight (kN/m ²)	Area of steel (mm ² /m)	Height to neutral axis (mm)	Moment of inertia (cm ⁴ /m)	Ultimate moment capacity (kNm/m)	
						Sagging	Hogging
0.9	0.86	0.11	1388	34.8	185	12.5	15.4
1.2	1.16	0.15	1872	34.8	245	18.5	22.2

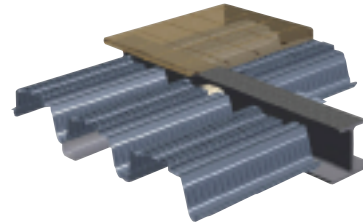
Comflor 100



Nominal thickness (mm)	Design thickness (mm)	Profile weight (kN/m ²)	Area of steel (mm ² /m)	Height to neutral axis (mm)	Moment of inertia (cm ⁴ /m)	Ultimate moment capacity (kNm/m)	
						Sagging	Hogging
1	0.96	0.14	1687	58	257	11.84	14.96
1.1	1.06	0.15	1855	58	278	12.08	16.8
1.2	1.16	0.16	2022	58	298	12.4	18.64

Slimdek

A low profile engineering floor solution, designed specifically for multi-story buildings. Ease of planning and servicing, combined with a reduction in building height, gives significant cost and speed of construction benefits. For further information on these products, please contact our Milton Keynes office.



Slimdek floor

4.3 Bi-steel

Bi-Steel is a strong, impermeable and rapid construction system that will benefit your project if you require blast protection, reduced construction thickness, impact resistance or if you are working to a very short construction programme.

Bi-Steel can offer significant technical and economic advantages for a wide range of structures, ranging from blast walls to floating structures. Our clients choose Bi-Steel because it provides the most effective protection plus the benefit of rapid construction and a finished product that is over 60% slimmer than reinforced concrete.

Strength, impermeability and modular construction are characteristics, which make Bi-Steel suitable for offshore construction both for oil & gas structures and renewable energy structures. If you require energy absorbing characteristics, blast protection, reduced construction thickness, leak resistance or if you are working to a very short construction programme. Bi-Steel provides offshore wind turbine foundations designed for ease of construction and rapid installation, to minimise risk and reduce lifetime costs.

Technical

A Bi-Steel panel consists of two parallel faceplates connected by an array of transverse bars. The bar connectors are simultaneously friction welded at each end to the steel faceplates. Bi-Steel modules may be used unfilled or filled with concrete, wax, sand, thermal insulation material or other materials depending on the final application. Further time and cost savings can be made because the Bi-Steel system does not require formwork or reinforcement. Bi-Steel has been developed over the past decade and has undergone an extensive research programme, which includes load bearing performance, energy absorption properties, fatigue research and connection methods.

Corefast allows lift and stair cores, often on a project's critical path, to be erected up to 85% faster than a reinforced concrete core. The system reduces overall project costs and improves site safety. The pre-fabricated modules or components is straightforward to assemble and significantly reduces construction time for a core. Corefast is available in modular or component form depending on project requirements. The system is suitable for cores from 3 storeys to over 100 storeys and any combination of lift cores and stairwells.

Surefast structures are fast to build and provide unrivalled force protection and security. Surefast enables savings in time and cost, plus improved safety, for a range of commercial, government, industrial and defence construction applications. Using modular Bi-Steel technology and simple connection methods Surefast buildings can be constructed in a matter of hours not months. Surefast structures are built on the strength of Bi-Steel, a steel and concrete hybrid which offers unrivalled protection against explosions and criminal attack.

Typical Bi-Steel applications include:

- Locations where space is at a premium, typically in town centres or other congested sites with restricted access, and where traffic is an issue
- Projects where speed of construction is of paramount importance
- High quality and high value buildings where superior quality of construction is specified
- Buildings in areas with restrictions on horizontal stability elements
- Restrictions on areas for horizontal stability elements
- Blast doors, walls and containment chambers
- Hardened structures/bunkers
- Storage tanks
- Impact & burster slabs
- Secure areas
- Ship & marine structures
- Special purpose structures



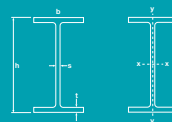
Bi-steel panel

5.0 Steel sections

5.1 BS4 sections

5.1.1 Universal beams

Material to EN 10025:2004. Dimensions and properties to BS 4-1:1993 Tolerance EN 10034:1993

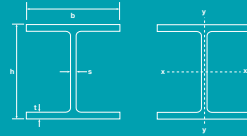


Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm
1016 x 305 x 487	487.0	1036.1	308.5	30.0	54.1
1016 x 305 x 438	438.0	1025.9	305.4	26.9	49.0
1016 x 305 x 393	393.0	1016.0	303.0	24.4	43.9
1016 x 305 x 349	349.0	1008.1	302.0	21.1	40.0
1016 x 305 x 314	314.0	1000.0	300.0	19.1	35.9
1016 x 305 x 272	272.0	990.1	300.0	16.5	31.0
1016 x 305 x 249	249.0	980.2	300.0	16.5	26.0
1016 x 305 x 222	222.0	970.3	300.0	16.0	21.1
914 x 419 x 388	388.0	921.0	420.5	21.4	36.6
914 x 419 x 343	343.3	911.8	418.5	19.4	32.0
914 x 305 x 289	289.1	926.6	307.7	19.5	32.0
914 x 305 x 253	253.4	918.4	305.5	17.3	27.9
914 x 305 x 224	224.2	910.4	304.1	15.9	23.9
914 x 305 x 201	200.9	903.0	303.3	15.1	20.2
838 x 292 x 226	226.5	850.9	293.8	16.1	26.8
838 x 292 x 194	193.8	840.7	292.4	14.7	21.7
838 x 292 x 176	175.9	834.9	291.7	14.0	18.8
762 x 267 x 197	196.8	769.8	268.0	15.6	25.4
762 x 267 x 173	173.0	762.2	266.7	14.3	21.6
762 x 267 x 147	146.9	754.0	265.2	12.8	17.5
762 x 267 x 134	133.9	750.0	264.4	12.0	15.5
686 x 254 x 170	170.2	692.9	255.8	14.5	23.7
686 x 254 x 152	152.4	687.5	254.5	13.2	21.0
686 x 254 x 140	140.1	683.5	253.7	12.4	19.0
686 x 254 x 125	125.2	677.9	253.0	11.7	16.2
610 x 305 x 238	238.1	635.8	311.4	18.4	31.4
610 x 305 x 179	179.0	620.2	307.1	14.1	23.6
610 x 305 x 149	149.1	612.4	304.8	11.8	19.7
610 x 229 x 140	139.9	617.2	230.2	13.1	22.1
610 x 229 x 125	125.1	612.2	229.0	11.9	19.6
610 x 229 x 113	113.0	607.6	228.2	11.1	17.3
610 x 229 x 101	101.2	602.6	227.6	10.5	14.8
533 x 210 x 122	122.0	544.5	211.9	12.7	21.3
533 x 210 x 109	109.0	539.5	210.8	11.6	18.8
533 x 210 x 101	101.0	536.7	210.0	10.8	17.4
533 x 210 x 92	92.1	533.1	209.3	10.1	15.6
533 x 210 x 82	82.2	528.3	208.8	9.6	13.2
457 x 191 x 98	98.3	467.2	192.8	11.4	19.6
457 x 191 x 89	89.3	463.4	191.9	10.5	17.7
457 x 191 x 82	82.0	460.0	191.3	9.9	16.0
457 x 191 x 74	74.3	457.0	190.4	9.0	14.5
457 x 191 x 67	67.1	453.4	189.9	8.5	12.7

Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm
457 x 152 x 82	82.1	465.8	155.3	10.5	18.9
457 x 152 x 74	74.2	462.0	154.4	9.6	17.0
457 x 152 x 67	67.2	458.0	153.8	9.0	15.0
457 x 152 x 60	59.8	454.6	152.9	8.1	13.3
457 x 152 x 52	52.3	449.8	152.4	7.6	10.9
406 x 178 x 74	74.2	412.8	179.5	9.5	16.0
406 x 178 x 67	67.1	409.4	178.8	8.8	14.3
406 x 178 x 60	60.1	406.4	177.9	7.9	12.8
406 x 178 x 54	54.1	402.6	177.7	7.7	10.9
406 x 140 x 46	46.0	403.2	142.2	6.8	11.2
406 x 140 x 39	39.0	398.0	141.8	6.4	8.6
356 x 171 x 67	67.1	363.4	173.2	9.1	15.7
356 x 171 x 57	57.0	358.0	172.2	8.1	13.0
356 x 171 x 51	51.0	355.0	171.5	7.4	11.5
356 x 171 x 45	45.0	351.4	171.1	7.0	9.7
356 x 127 x 39	39.1	353.4	126.0	6.6	10.7
356 x 127 x 33	33.1	349.0	125.4	6.0	8.5
305 x 165 x 54	54.0	310.4	166.9	7.9	13.7
305 x 165 x 46	46.1	306.6	165.7	6.7	11.8
305 x 165 x 40	40.3	303.4	165.0	6.0	10.2
305 x 127 x 48	48.1	311.0	125.3	9.0	14.0
305 x 127 x 42	41.9	307.2	124.3	8.0	12.1
305 x 127 x 37	37.0	304.4	123.3	7.1	10.7
305 x 102 x 33	32.8	312.7	102.4	6.6	10.8
305 x 102 x 28	28.2	308.7	101.8	6.0	8.8
305 x 102 x 25	24.8	305.1	101.6	5.8	7.0
254 x 146 x 43	43.0	259.6	147.3	7.2	12.7
254 x 146 x 37	37.0	256.0	146.4	6.3	10.9
254 x 146 x 31	31.1	251.4	146.1	6.0	8.6
254 x 102 x 28	28.3	260.4	102.2	6.3	10.0
254 x 102 x 25	25.2	257.2	101.9	6.0	8.4
254 x 102 x 22	22.0	254.0	101.6	5.7	6.8
203 x 133 x 30	30.0	206.8	133.9	6.4	9.6
203 x 133 x 25	25.1	203.2	133.2	5.7	7.8
203 x 102 x 23	23.1	203.2	101.8	5.4	9.3
178 x 102 x 19	19.0	177.8	101.2	4.8	7.9
152 x 89 x 16	16.0	152.4	88.7	4.5	7.7
127 x 76 x 13	13.0	127.0	76.0	4.0	7.6

5.1.2 Universal columns

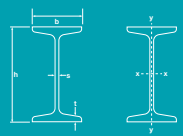
Material to EN 10025:2004
Dimensions and properties to BS 4-1:1993
Tolerance EN 10034:1993



Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm
356 x 406 x 634	633.9	474.6	424.0	47.6	77.0
356 x 406 x 551	551.0	455.6	418.5	42.1	67.5
356 x 406 x 467	467.0	436.6	412.2	35.8	58.0
356 x 406 x 393	393.0	419.0	407.0	30.6	49.2
356 x 406 x 340	339.9	406.4	403.0	26.6	42.9
356 x 406 x 287	287.1	393.6	399.0	22.6	36.5
356 x 406 x 235	235.1	381.0	394.8	18.4	30.2
356 x 368 x 202	201.9	375.6	374.4	16.5	27.0
356 x 368 x 177	177.0	368.2	372.6	14.4	23.8
356 x 368 x 153	152.9	362.0	370.5	12.3	20.7
356 x 368 x 129	129.0	355.6	368.6	10.4	17.5
305 x 305 x 283	282.9	365.3	322.2	26.8	44.1
305 x 305 x 240	240.0	352.5	318.4	23.0	37.7
305 x 305 x 198	198.1	339.9	314.5	19.1	31.4
305 x 305 x 158	158.1	327.1	311.2	15.8	25.0
305 x 305 x 137	136.9	320.5	309.2	13.8	21.7
305 x 305 x 118	117.9	314.5	307.4	12.0	18.7
305 x 305 x 97	96.9	307.9	305.3	9.9	15.4
254 x 254 x 167	167.1	289.1	265.2	19.2	31.7
254 x 254 x 132	132.0	276.3	261.3	15.3	25.3
254 x 254 x 107	107.1	266.7	258.8	12.8	20.5
254 x 254 x 89	88.9	260.3	256.3	10.3	17.3
254 x 254 x 73	73.1	254.1	254.6	8.6	14.2
203 x 203 x 86	86.1	222.2	209.1	12.7	20.5
203 x 203 x 71	71.0	215.8	206.4	10.0	17.3
203 x 203 x 60	60.0	209.6	205.8	9.4	14.2
203 x 203 x 52	52.0	206.2	204.3	7.9	12.5
203 x 203 x 46	46.1	203.2	203.6	7.2	11.0
152 x 152 x 37	37.0	161.8	154.4	8.0	11.5
152 x 152 x 30	30.0	157.6	152.9	6.5	9.4
152 x 152 x 23	23.0	152.4	152.2	5.8	6.8

5.1.3 Joists

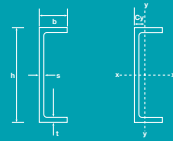
Material to EN 10025:2004
Dimensions and properties to BS 4-1:1993
Tolerance EN 10034:1993



Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm
254 x 203 x 82	82.0	254.0	203.2	10.2	19.9
203 x 152 x 52	52.3	203.2	152.4	8.9	16.5
152 x 127 x 37	37.3	152.4	127.0	10.4	13.2
127 x 114 x 29	29.3	127.0	114.3	10.2	11.5
127 x 114 x 27	26.9	127.0	114.3	7.4	11.4
102 x 102 x 23	23.0	101.6	101.6	9.5	10.3
102 x 44 x 7	7.5	101.6	44.5	4.3	6.1
89 x 89 x 19	19.5	88.9	88.9	9.5	9.9
76 x 76 x 13	12.8	76.2	76.2	5.1	8.4

5.1.4 Parallel flange channels (PFC)

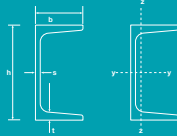
Material to EN 10025:2004 Dimensions and properties to BS 4-1:1993 Tolerances to EN 10279:2000



Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm
430 x 100 x 64	64.4	430	100	11.0	19.0
380 x 100 x 54	54.0	380	100	9.5	17.5
300 x 100 x 46	45.5	300	100	9.0	16.5
300 x 90 x 41	41.4	300	90	9.0	15.5
260 x 90 x 35	34.8	260	90	8.0	14.0
260 x 75 x 28	27.6	260	75	7.0	12.0
230 x 90 x 32	32.2	230	90	7.5	14.0
230 x 75 x 26	25.7	230	75	6.5	12.5
200 x 90 x 30	29.7	200	90	7.0	14.0
200 x 75 x 23	23.4	200	75	6.0	12.5
180 x 90 x 26	26.1	180	90	6.5	12.5
180 x 75 x 20	20.3	180	75	6.0	10.5
150 x 90 x 24	23.9	150	90	6.5	12.0
150 x 75 x 18	17.9	150	75	5.5	10.0
125 x 65 x 15	14.8	125	65	5.5	9.5
100 x 50 x 10	10.2	100	50	5.0	8.5

5.1.5 Tapered flange channels (TFC)

Material to EN 10025:2004 Dimensions and properties to BS 4-1:1993. Tolerances to 10279:2000



Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm
76 x 38	6.70	76.2	38.1	5.1	6.8

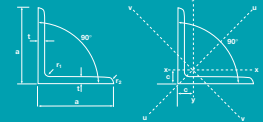
Also available*

40 x 20 x 5	60 x 30 x 6	80 x 45 x 6
40 x 35 x 5	60 x 40 x 6	100 x 50 x 6
50 x 25 x 5	65 x 42 x 5.5	120 x 55 x 7
50 x 38 x 5	70 x 40 x 6	140 x 60 x 7

* Please refer to Sales Representative for tolerances

5.1.6 Equal angles

Material to EN 10025:2004. Dimensions and properties to EN 10056-1:1999. Tolerance EN 10056-2:1999



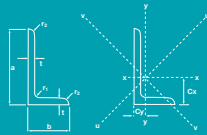
Designation	Mass per metre kg/m
250 x 250 x 35	162.0
250 x 250 x 25	115.7
200 x 200 x 25	74.1
200 x 200 x 24	71.1
200 x 200 x 20	59.9
200 x 200 x 18	54.3
200 x 200 x 16	48.5
200 x 200 x 15	45.5
175 x 175 x 15	34.8
175 x 175 x 12	27.8
150 x 150 x 20	44.6
150 x 150 x 19	42.3
150 x 150 x 18	40.1
150 x 150 x 16	36.1
150 x 150 x 15	33.8
150 x 150 x 13	29.6
150 x 150 x 12	27.3
150 x 150 x 11	25.3
150 x 150 x 10	23.0
130 x 130 x 12	23.6
120 x 120 x 18	28.3
120 x 120 x 15	26.6
120 x 120 x 13	23.1
120 x 120 x 12	21.6
120 x 120 x 11	19.8
120 x 120 x 10	18.2
120 x 120 x 9	16.4
120 x 120 x 8	14.7
100 x 100 x 15	21.9
100 x 100 x 13	19.0
100 x 100 x 12	17.8
100 x 100 x 11	16.3
100 x 100 x 10	15.0
100 x 100 x 9	13.5
100 x 100 x 8	12.2
100 x 100 x 7	10.7
90 x 90 x 12	15.9
90 x 90 x 10	13.4
90 x 90 x 9	12.2
90 x 90 x 8	10.9
90 x 90 x 7	9.6
90 x 90 x 6	8.3
80 x 80 x 10	11.9
80 x 80 x 8	9.6
80 x 80 x 7	6.2
80 x 80 x 6.5	6.2
80 x 80 x 6	7.3
80 x 80 x 5.5	6.2
80 x 80 x 5	6.2

* Please refer to Sales Representative for tolerances

Designation	Mass per metre kg/m
75 x 75 x 10	11.1
75 x 75 x 8	9.0
75 x 75 x 7	7.9
75 x 75 x 6	6.9
75 x 75 x 5	5.8
75 x 75 x 4	4.7
70 x 70 x 10	10.3
70 x 70 x 9	9.3
70 x 70 x 8	8.4
70 x 70 x 7	7.3
70 x 70 x 6	6.4
70 x 70 x 5	5.3
65 x 65 x 9	8.0
65 x 65 x 8	7.1
65 x 65 x 7	6.2
65 x 65 x 6	5.3
65 x 65 x 5	4.4
60 x 60 x 10	8.7
60 x 60 x 8	7.1
60 x 60 x 7	6.2
60 x 60 x 6	5.4
60 x 60 x 5	4.6
60 x 60 x 4	3.7
55 x 55 x 6	4.6
50 x 50 x 8	5.8
50 x 50 x 7	5.1
50 x 50 x 6	4.5
50 x 50 x 5	3.8
50 x 50 x 4	3.1
50 x 50 x 3	2.3
45 x 45 x 6	4.0
45 x 45 x 5	3.4
45 x 45 x 4.5	2.7
45 x 45 x 4	2.7
45 x 45 x 3	2.1
40 x 40 x 6	3.5
40 x 40 x 5	3.0
40 x 40 x 4	2.4
40 x 40 x 3	1.8
35 x 35 x 5	3.5
35 x 35 x 4	2.8
35 x 35 x 3.5	2.4
30 x 30 x 6	2.6
30 x 30 x 5	2.2
30 x 30 x 4	1.8
30 x 30 x 3.5	1.4
30 x 30 x 3	1.4
25 x 25 x 5	1.8
25 x 25 x 4	1.5
25 x 25 x 3	1.1
20 x 20 x 3	0.7

5.1.7 Unequal angles

Material to EN 10025-2:2003.
Dimensions and properties to EN 10056-1:1999.
Tolerance EN 10056-2:1999



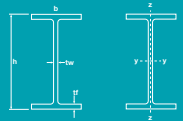
Designation	Mass per metre kg/m
200 x 150 x 18	47.1
200 x 150 x 15	39.6
200 x 150 x 12	32.0
200 x 100 x 15	33.7
200 x 100 x 12	27.3
200 x 100 x 10	23.0
150 x 90 x 15	26.6
150 x 90 x 13	21.5
150 x 90 x 12	21.6
150 x 90 x 10	18.2
150 x 90 x 9	16.4
150 x 75 x 15	24.8
150 x 75 x 12	20.2
150 x 75 x 10	17.0
125 x 75 x 12	17.8
125 x 75 x 11	19.9
125 x 75 x 10	15.0
125 x 75 x 7	10.7
125 x 75 x 8	12.2
120 x 80 x 12	17.8
120 x 80 x 10	15.0
120 x 80 x 8	12.2
120 x 75 x 10	14.1
120 x 75 x 8	11.4
100 x 75 x 12	15.4
100 x 75 x 11	13.0
100 x 75 x 10	13.0
100 x 75 x 8	10.6
100 x 75 x 7	9.30
100 x 65 x 10	12.3
100 x 65 x 8	9.94
100 x 65 x 7	8.77
100 x 50 x 10	9.46
100 x 50 x 8	7.65
100 x 50 x 6	5.73
90 x 70 x 8	9.63
90 x 65 x 8	8.95
90 x 65 x 6	6.71
90 x 60 x 8	8.26
90 x 60 x 6	6.19
80 x 65 x 10	9.94
80 x 65 x 8	7.95
80 x 65 x 6	5.96
80 x 60 x 8	8.32

Designation	Mass per metre kg/m
80 x 60 x 7	7.36
80 x 60 x 6	6.34
80 x 40 x 8	5.64
80 x 40 x 6	4.23
75 x 50 x 8	7.39
75 x 50 x 7	6.47
75 x 50 x 6	5.65
75 x 50 x 5	4.71
65 x 50 x 8	6.76
65 x 50 x 7	5.92
65 x 50 x 6	5.18
65 x 50 x 5	4.35
60 x 40 x 7	4.50
60 x 40 x 6	3.85
60 x 40 x 5	3.21
60 x 30 x 6	4.00
60 x 30 x 5	3.36
50 x 40 x 5	3.73
50 x 30 x 4.5	2.52
45 x 30 x 4.5	2.27
40 x 25 x 5	1.87
40 x 25 x 4	1.93
40 x 20 x 4	1.54
40 x 20 x 3	1.16
35 x 20 x 3.5	1.18
30 x 20 x 4	1.16
30 x 20 x 3	0.87

5.2 European sections

5.2.1 European beams

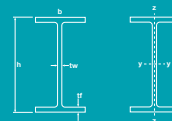
Material to EN 10025:2004
Dimensions and properties to Euronorm 19-57/DIN 1025
Tolerance EN 10034:1993



Designation	Mass per metre G kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web tw mm	Thickness Flange tf mm
Euronorm 19-57 Section					
IPE 100 A	6.89	98	55	3.6	4.7
IPE 100	8.1	100	55	4.1	5.7
IPE 120 A	8.66	118	64	3.8	5.1
IPE 120	10.4	120	64	4.4	6.3
IPE 140 A	10.5	138	73	3.8	5.6
IPE 140	12.9	140	73	4.7	6.9
IPE 140 R	14.4	142	72	5.3	7.8
IPE 160 A	12.7	157	82	4	5.9
IPE 160	15.8	160	82	5	7.4
IPE 160 R	17.7	162	81	5.6	8.5
IPE 180 A	15.4	177	91	4.3	6.5
IPE 180	18.8	180	91	5.3	8
IPE 180 O	21.3	182	92	6	9
IPE 180 R	22.1	183	89	6.4	9.5
IPE 200 A	18.4	197	100	4.5	7
IPE 200	22.4	200	100	5.6	8.5
IPE 200 O	25.1	202	102	6.2	9.5
IPE 200 R	26.6	204	98	6.6	10.5
IPE 220 A	22.2	217	110	5	7.7
IPE 220	26.2	220	110	5.9	9.2
IPE 220 O	29.4	222	112	6.6	10.2
IPE 220 R	31.6	225	108	6.7	11.8
IPE 240 A	26.2	237	120	5.2	8.3
IPE 240	30.7	240	120	6.2	9.8
IPE 240 O	34.3	242	122	7	10.8
IPE 240 R	37.3	245	118	7.5	12.3
IPE 270 A	30.7	267	135	5.5	8.7
IPE 270	36.1	270	135	6.6	10.2
IPE 270 O	42.3	274	136	7.5	12.2
IPE 270 R	44	276	133	7.7	13.1
IPE 300 A	36.5	297	150	6.1	9.2
IPE 300	42.2	300	150	7.1	10.7
IPE 300 O	49.3	304	152	8	12.7
IPE 300 R	51.7	306	147	8.5	13.7
IPE 330 A	43	327	160	6.5	10
IPE 330	49.1	330	160	7.5	11.5
IPE 330 O	57	334	162	8.5	13.5
IPE 330 R	60.3	336	158	9.2	14.5
IPE 360 A	50.2	357.6	170	6.6	11.5
IPE 360	57.1	360	170	8	12.7
IPE 360 O	66	364	172	9.2	14.7
IPE 360 R	70.3	366	168	9.9	16

5.2.1 European beams

Material to EN 10025:2004
Dimensions and properties to Euronorm 19-57/DIN 1025
Tolerance EN 10034:1993

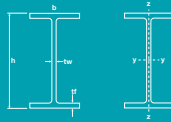


Designation	Mass per metre G kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web tw mm	Thickness Flange tf mm
Euronorm 19-57 Section					
IPE 400 A	57.4	397	180	7	12
IPE 400	66.3	400	180	8.6	13.5
IPE 400 O	75.7	404	182	9.7	15.5
IPE 400 R	81.5	407	178	10.6	17
IPE 400 V	84	408	182	10.6	17.5
IPE 450 A	67.2	447	190	7.6	13.1
IPE 450	77.6	450	190	9.4	14.6
IPE 450 O	92.4	456	192	11	17.6
IPE 450 R	95.2	458	188	11.3	18.6
IPE 450 V	104	460	194	12.4	19.6
IPE 500 A	79.4	497	200	8.4	14.5
IPE 500	90.7	500	200	10.2	16
IPE 500 O	107	506	202	12	19
IPE 500 R	111	508	198	12.6	20
IPE 550 A	92.1	547	210	9	15.7
IPE 550	106	550	210	11.1	17.2
IPE 550 O	123	556	212	12.7	20.2
IPE 550 R	134	560	210	14	22.2
IPE 550 V	159	566	216	17.1	25.2
IPE 600 A	108	597	220	9.8	17.5
IPE 600	122	600	220	12	19
IPE 600 O	154	610	224	15	24
IPE 600 R	144	608	218	14	23
IPE 600 V	184	618	228	18	28
IPE 750 x 137	137	753	263	11.5	17
IPE 750 x 147	147	753	265	13.2	17
IPE 750 x 161	160	758	266	13.8	19.3
IPE 750 x 173	173	762	267	14.4	21.6
IPE 750 x 185	185	766	267	14.9	23.6
IPE 750 x 196	196	770	268	15.6	25.4
IPE 750 x 210	210	775	268	16	28
IPE 750 x 222	222	778	269	17	29.5

Designation	Mass per metre G kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web tw mm	Thickness Flange tf mm
Euronorm 19-57 Section					
HE 100 AA	12.2	91	100	4.2	5.5
HE 100 A	16.7	96	100	5	8
HE 100 B	20.4	100	100	6	10
HE 100 M	41.8	120	106	12	20
HE 120 AA	14.6	109	120	4.2	5.5
HE 120 A	19.9	114	120	5	8
HE 120 B	26.7	120	120	6.5	11
HE 120 M	52.1	140	126	12.5	21
HE 140 AA	18.1	128	140	4.3	6
HE 140 A	24.7	133	140	5.5	8.5
HE 140 B	33.7	140	140	7	12
HE 140 M	63.2	160	146	13	22
HE 160 AA	23.8	148	160	4.5	7
HE 160 A	30.4	152	160	6	9
HE 160 B	42.6	160	160	8	13
HE 160 M	76.2	180	166	14	23
HE 180 AA	28.7	167	180	5	7.5
HE 180 A	35.5	171	180	6	9.5
HE 180 B	51.2	180	180	8.5	14
HE 180 M	88.9	200	186	14.5	24
HE 200 AA	34.6	186	200	5.5	8
HE 200 A	42.3	190	200	6.5	10
HE 200 B	61.3	200	200	9	15
HE 200 M	103	220	206	15	25
HE 220 AA	40.4	205	220	6	8.5
HE 220 A	50.5	210	220	7	11
HE 220 B	71.5	220	220	9.5	16
HE 220 M	117	240	226	15.5	26
HE 240 AA	47.4	224	240	6.5	9
HE 240 A	60.3	230	240	7.5	12
HE 240 B	83.2	240	240	10	17
HE 240 M	157	270	248	18	32
HE 260 AA	54.1	244	260	6.5	9.5
HE 260 A	68.2	250	260	7.5	12.5
HE 260 B	93	260	260	10	17.5
HE 260 M	172	290	268	18	32.5
HE 280 AA	61.2	264	280	7	10
HE 280 A	76.4	270	280	8	13
HE 280 B	103	280	280	10.5	18
HE 280 M	189	310	288	18.5	33
HE 300 AA	69.8	283	300	7.5	10.5
HE 300 A	88.3	290	300	8.5	14
HE 300 B	117	300	300	11	19
HE 300 M	238	340	310	21	39
HE 320 AA	74.2	301	300	8	11
HE 320 A	97.6	310	300	9	15.5
HE 320 B	127	320	300	11.5	20.5
HE 320 M	245	359	309	21	40
HE 340 AA	78.9	320	300	8.5	11.5
HE 340 A	105	330	300	9.5	16.5
HE 340 B	134	340	300	12	21.5
HE 340 M	248	377	309	21	40
HE 360 AA	83.7	339	300	9	12
HE 360 A	112	350	300	10	17.5
HE 360 B	142	360	300	12.5	22.5
HE 360 M	250	395	308	21	40

5.2.1 European beams

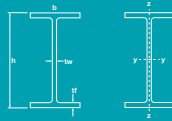
Material to EN 10025:2004
Dimensions and properties to Euronorm 53-62/DIN 1025
Tolerance EN 10034:1993



Designation	Mass per metre G kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web tw mm	Thickness Flange tf mm
Euronorm 19-57 Section					
HE 400 AA	92.4	378	300	9.5	13
HE 400 x 107	107	384	297	10	16
HE 400 A	125	390	300	11	19
HE 400 B	155	400	300	13.5	24
HE 400 M	256	432	307	21	40
HE 450 AA	100	425	300	10	13.5
HE 450 x 123	123	435	300	10.2	18.5
HE 450 A	140	440	300	11.5	21
HE 450 B	171	450	300	14	26
HE 450 M	263	478	307	21	40
HE 500 AA	107	472	300	10.5	14
HE 500 A	155	490	300	12	23
HE 500 B	187	500	300	14.5	38
HE 500 M	270	524	306	21	40
HE 550 AA	120	522	300	11.5	15
HE 550 A	166	540	300	12.5	24
HE 550 B	199	550	300	15	29
HE 550 M	278	572	306	21	40
HE 600 AA	129	571	300	12	15.5
HE 600 x 137	137	575	300	11.8	17.5
HE 600 x 151	151	582	300	11.6	20.6
HE 600 x 174	174	588	300	13.6	23.9
HE 600 A	178	590	300	13	25
HE 600 B	212	600	300	15.5	30
HE 600 M	285	620	305	21	40
HE 650 AA	138	620	300	12.5	16
HE 650 A	190	640	300	13.5	26
HE 650 B	225	650	300	16	31
HE 650 M	293	668	305	21	40
HE 700 AA	150	670	300	13	17
HE 700 x 166	166	678	300	12.5	21
HE 700 A	204	690	300	14.5	27
HE 700 B	241	700	300	17	32
HE 700 M	301	716	304	21	40
HE 800 AA	172	770	300	14	18
HE 800 A	224	790	300	15	28
HE 800 B	262	800	300	17.5	33
HE 800 M	317	814	303	21	40
HE 900 AA	198	870	300	15	20
HE 900 A	252	890	300	16	30
HE 900 B	291	900	300	18.5	35
HE 900 M	333	910	302	21	40
HE 1000 AA	222	970	300	16	21
HE 1000 A	272	990	300	16.5	31
HE 1000 B	314	1000	300	19	36
HE 1000 M	349	1008	302	21	40
HE 1000 x 393	393	1016	303	24.4	43.9
HE 1000 x 415	415	1020	304	26	46
HE 1000 x 494	494	1036	309	31	54

5.2.2 European standard beams

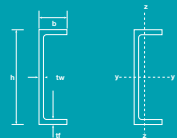
DIN 1025-1



Designation	Mass per metre G kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web tw mm	Thickness Flange tf mm
IPN 100	8.34	100	50	4.5	6.8
IPN 120	11.1	120	58	5.1	7.7
IPN 140	14.3	140	66	5.7	8.6
IPN 160	17.9	160	74	6.3	9.5
IPN 180	21.9	180	82	6.9	10.4
IPN 200	26.2	200	90	7.5	11.3
IPN 220	31.1	220	98	8.1	12.2
IPN 240	36.2	240	106	8.7	13.1
IPN 260	41.9	260	113	9.4	14.1
IPN 280	47.9	280	119	10.1	15.2
IPN 300	54.2	300	125	10.8	16.2
IPN 320	61	320	131	11.5	17.3
IPN 340	68	340	137	12.2	18.3
IPN 360	76.1	360	143	13	19.5
IPN 380	84	380	149	13.7	20.5
IPN 400	92.4	400	155	14.4	21.6
IPN 450	115	450	170	16.2	24.3
IPN 500	141	500	185	18	27
IPN 550	166	550	200	19	30

5.2.3 European parallel flange channels (UPE)

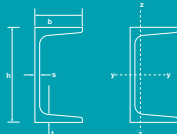
DIN 1026



Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web tw mm	Thickness Flange tf mm
400 x 115 x 72.2	72.2	400	115	13.5	18
360 x 110 x 61.2	61.2	360	110	12	17
330 x 105 x 53.2	53.2	330	105	11	16
300 x 100 x 44.4	44.4	300	100	9.5	15
270 x 95 x 35.2	35.2	270	95	7.5	13.5
240 x 90 x 30.2	30.2	240	90	7	12.5
220 x 85 x 26.6	26.6	220	85	6.5	12
200 x 80 x 22.8	22.8	200	80	6	11
180 x 75 x 19.7	19.7	180	75	5.5	10.5
160 x 70 x 17.0	17.0	160	70	5.5	9.5
140 x 65 x 14.5	14.5	140	65	5	9
120 x 60 x 12.1	12.1	120	60	5	8
100 x 55 x 9.82	9.82	100	55	4.5	7.5
80 x 50 x 7.90	7.90	80	50	4	7

5.2.4 European tapered flange channels (UPN)

DIN 1026

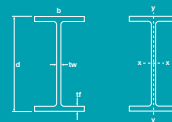


Designation	Mass per metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web tw mm	Thickness Flange tf mm
400 x 110 x 71.8	71.8	400	110	14	18
380 x 102 x 63.1	63.1	380	102	13.5	16
350 x 100 x 60.6	60.6	350	100	14	16
320 x 100 x 59.5	59.5	320	100	14	17.5
300 x 100 x 46.2	46.2	300	100	10	16
280 x 95 x 42	41.8	280	95	10	15
260 x 90 x 38	37.9	260	90	10	14
240 x 85 x 33	33.2	240	85	9.5	13
220 x 80 x 29	29.4	220	80	9	12.5
200 x 75 x 25	25.3	200	75	8.5	11.5
180 x 70 x 22	22	180	70	8	11
160 x 65 x 19	18.8	160	65	7.5	10.5
140 x 60 x 16	16	140	60	7	10
120 x 55 x 13.4	13.4	120	55	7	9
100 x 50 x 10.6	10.6	100	50	6	8.5
80 x 45 x 9	8.6	80	45	6	8
70 x 40 x 6.8	6.8	70	40	6	6.5
65 x 42 x 7	7.7	65	42	5.5	5
60 x 30 x 5.1	5.1	60	30	6	6
50 x 38 x 6	5.6	50	36	7	7
50 x 25 x 3.9	3.9	50	25	5	6
40 x 20 x 2.9	2.9	40	20	5	5.5

5.3 American sections

5.3.1 American W-sections

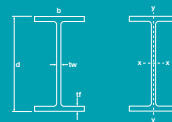
Material to ASTM A36
Dimensions and properties to ASTM A6 & A992



Designation	Mass per foot lb	Size in	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness Flange tf mm	
W44 x 16	335	1100	400	499	1118	405	26	45
W44 x 16	290	1100	400	433	1108	402	22	40
W44 x 16	262	1100	400	390	1100	400	20	46
W44 x 16	230	1100	400	343	1090	400	18	31
W40 x 12	593	1016	305	883	1092	424	45.5	82
W40 x 12	503	1016	305	748	1068	417	39	70
W40 x 12	431	1016	305	642	1048	412	34	60
W40 x 12	397	1016	305	591	1040	409	31	55.9
W40 x 12	362	1016	305	539	1030	407	28.4	51.1
W40 x 12	324	1016	305	483	1020	404	25.4	46
W40 x 12	297	1016	305	443	1012	402	23.6	41.9
W40 x 12	277	1016	305	412	1008	402	21.1	40
W40 x 12	249	1016	305	371	1000	400	19	36.1
W40 x 12	215	1016	305	321	990	400	16.5	31
W40 x 12	199	1016	305	296	982	400	16.5	27.1
W40 x 12	331	1016	305	494	1036	309	31	54
W40 x 12	327	1016	305	486.6	1036.1	308.5	30	54.1
W40 x 12	294	1016	305	436.9	1025.9	305.4	26.9	49
W40 x 12	278	1016	305	415	1020	304	26	46
W40 x 12	264	1016	305	392.7	1016	303	24.4	43.9
W40 x 12	235	1016	305	349.4	1008.1	302	21.1	40
W40 x 12	211	1016	305	314.3	1000	300	19.1	35.9
W40 x 12	183	1016	305	272.3	990.1	300	16.5	31
W40 x 12	167	1016	305	248.7	980.2	300	16.5	26
W40 x 12	149	1016	305	222	970.3	300	16	21.1
W36 x 16 1/2	650	914	419	967	1028	446	50	89.9
W36 x 16 1/2	527	914	419	784	996	437	40.9	73.9
W36 x 16 1/2	439	914	419	653	972	431	34.5	62
W36 x 16 1/2	393	914	419	585	960	427	31	55.9
W36 x 16 1/2	359	914	419	533.8	950	424.9	28.4	51.1
W36 x 16 1/2	328	914	419	488	942.1	422.4	25.9	47
W36 x 16 1/2	300	914	419	447.1	932.7	423	24	42.7
W36 x 16 1/2	280	914	419	418.1	928	422	22.5	39.9
W36 x 16 1/2	260	914	419	388	921	420.5	21.4	36.6
W36 x 16 1/2	245	914	419	364.8	916	419.4	20.3	34.3
W36 x 16 1/2	230	914	419	343.3	911.8	418.5	19.4	32
W36 x 12	386	914	305	575.4	992.9	321.8	36.1	65
W36 x 12	349	914	305	520.8	980.7	318.8	33	58.9
W36 x 12	318	914	305	473.7	970.8	315.7	30	54.1
W36 x 12	285	914	305	425.3	960.9	312.8	26.9	49
W36 x 12	256	914	305	381.6	950.7	310.3	24.4	43.9
W36 x 12	232	914	305	345.1	942.9	307.9	22.1	39.9
W36 x 12	210	914	305	313	932	309.4	21.1	34.5
W36 x 12	194	914	305	289.1	926.6	307.7	19.5	32
W36 x 12	182	914	305	271.7	923	307	18.4	30
W36 x 12	170	914	305	253.4	918.4	305.5	17.3	27.9
W36 x 12	160	914	305	238.1	914.5	304.8	16.5	25.9
W36 x 12	150	914	305	224.2	910.4	304.1	15.9	23.9
W36 x 12	135	914	305	200.9	903	303.3	15.1	20.2

5.3.1 American W-sections

Material to ASTM A36
Dimensions and properties to ASTM A6 & A992

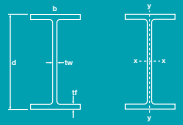


Designation	Mass per foot lb	Size in	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness Flange tf mm	
W33 x 15 ³ / ₄	387	838	400	576	913	411	32	57.9
W33 x 15 ³ / ₄	354	838	400	527.6	903	409	29.5	53.1
W33 x 15 ³ / ₄	318	838	400	473.3	893.1	406	26.4	48
W33 x 15 ³ / ₄	291	838	400	433.3	885	404	24.4	43.9
W33 x 15 ³ / ₄	263	838	400	391.9	877.1	401.4	22.1	39.9
W33 x 15 ³ / ₄	241	838	400	359.4	868	403	21.1	35.6
W33 x 15 ³ / ₄	221	838	400	329.4	862	401	19.7	32.4
W33 x 15 ³ / ₄	201	838	400	299.3	855.4	399.9	18.2	29.2
W33 x 11 ¹ / ₂	219	838	292	326.6	877.1	297.2	22.1	39.9
W33 x 11 ¹ / ₂	204	838	292	303.3	871.2	295.7	20.6	37.1
W33 x 11 ¹ / ₂	187	838	292	278.6	865.1	294.1	19.1	34.1
W33 x 11 ¹ / ₂	169	838	292	250.7	859	292.1	17	31
W33 x 11 ¹ / ₂	152	838	292	226.5	850.9	293.8	16.1	26.8
W33 x 11 ¹ / ₂	141	838	292	210.8	846.1	293	15.4	24.4
W33 x 11 ¹ / ₂	130	838	292	193.8	840.7	292.4	14.7	21.7
W33 x 11 ¹ / ₂	118	838	292	175.9	834.9	291.7	14	18.8
W30 x 15	326	762	381	484.8	823	390.4	29	52.1
W30 x 15	292	762	381	433.9	813.1	387.4	25.9	47
W30 x 15	261	762	381	388.3	802.9	384.9	23.6	41.9
W30 x 15	235	762	381	349.4	795	382	21.1	38.1
W30 x 15	211	762	381	314.2	785.9	383.7	19.7	33.4
W30 x 15	191	762	381	283.9	779	382	18	30.1
W30 x 15	173	762	381	257.6	773	381	16.6	27.1
W30 x 10 ¹ / ₂	148	762	267	220.3	779	266.2	16.5	30
W30 x 10 ¹ / ₂	132	762	267	196.8	769.8	268	15.6	25.4
W30 x 10 ¹ / ₂	124	762	267	184.8	766	267	14.9	23.6
W30 x 10 ¹ / ₂	116	762	267	173	762.2	266.7	14.3	21.6
W30 x 10 ¹ / ₂	108	762	267	160.4	758	266	13.8	19.3
W30 x 10 ¹ / ₂	99	762	267	146.9	754	265.2	12.8	17.5
W30 x 10 ¹ / ₂	90	762	267	133.9	750	264.4	12	15.5
W27 x 14	307	686	356	457	752	366.9	29.5	53.1
W27 x 14	281	686	356	418.3	744	364.4	26.9	49
W27 x 14	258	686	356	383.9	736.1	362.4	24.9	45
W27 x 14	235	686	356	350.2	728	360.4	23.1	40.9
W27 x 14	217	686	356	323	722.1	358.5	21.1	38.1
W27 x 14	194	686	356	288.2	714	356.4	19	34
W27 x 14	178	686	356	264.5	706.4	357.8	18.4	30.2
W27 x 14	161	686	356	239.9	700.8	356.1	16.8	27.4
W27 x 14	146	686	356	217.8	695	355	15.4	24.8
W27 x 10	221	686	254	328.3	739.9	264.8	25.9	47
W27 x 10	201	686	254	299.8	732	262.8	23.9	42.9
W27 x 10	182	686	254	270.8	723.9	260.2	21.6	39.1
W27 x 10	159	686	254	236	714	257.8	19.1	34
W27 x 10	129	686	254	191.4	702	254	15.5	27.9
W27 x 10	114	686	254	170.2	692.9	255.8	14.5	23.7
W27 x 10	102	686	254	152.4	687.5	254.5	13.2	21
W27 x 10	94	686	254	140.1	683.5	253.7	12.4	19
W27 x 10	84	686	254	125.2	677.9	253	11.7	16.2
W24 x 12 ³ / ₄	370	610	324	551	711	347	38.6	69.1
W24 x 12 ³ / ₄	335	610	324	498	699	343	35.1	63

Designation	Mass per foot lb	Size in	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness Flange tf mm	
W24 x 12 ³ / ₄	306	610	324	455	689.4	340	32	57.9
W24 x 12 ³ / ₄	279	610	324	416.3	679	338	29.5	53.1
W24 x 12 ³ / ₄	250	610	324	373	669	334.9	26.4	48
W24 x 12 ³ / ₄	229	610	324	341.1	660.9	333	24.4	43.9
W24 x 12 ³ / ₄	207	610	324	308.2	653	330.4	22.1	39.9
W24 x 12 ³ / ₄	192	610	324	286.1	647	329	20.6	37.1
W24 x 12 ³ / ₄	176	610	324	261.9	641	327	19	34
W24 x 12 ³ / ₄	162	610	324	238.9	635	329	17.1	31
W24 x 12 ³ / ₄	146	610	324	218.6	628	328	16.5	27.7
W24 x 12 ³ / ₄	131	610	324	196.4	622	327	15.4	24.4
W24 x 12 ³ / ₄	117	610	324	175	616	325	14	21.6
W24 x 12 ³ / ₄	104	610	324	155.6	611	324	12.7	19
W24 x 9	198	610	229	295.1	667	240.5	25.9	47
W24 x 9	163	610	229	243.1	651	236	21.6	39.1
W24 x 9	146	610	229	218.2	643.1	234.1	19.6	35.1
W24 x 9	128	610	229	190.2	635	231.5	17.1	31
W24 x 9	114	610	229	171.6	628.9	230	15.5	27.9
W24 x 9	103	610	229	153.5	623.1	228.6	14	24.9
W24 x 9	94	610	229	139.9	617.2	230.2	13.1	22.1
W24 x 9	84	610	229	125.1	612.2	229	11.9	19.6
W24 x 9	76	610	229	113	608	228.2	11.1	17.3
W24 x 9	68	610	229	101.2	602.6	227.6	10.5	14.8
W24 x 7	62	610	178	92.3	603	179	10.9	15
W24 x 7	55	610	178	81.9	599	178	10	12.8
W21 x 12 ¹ / ₄	275	533	312	409	612.9	327.4	31	55.6
W21 x 12 ¹ / ₄	248	533	312	369.4	603	324.4	28.2	50.5
W21 x 12 ¹ / ₄	223	533	312	331.2	593	322	25.4	45.5
W21 x 12 ¹ / ₄	201	533	312	299.5	585	319	23.1	41.4
W21 x 12 ¹ / ₄	182	533	312	271.3	577	317	21.1	37.6
W21 x 12 ¹ / ₄	166	533	312	246.6	571	315	19	34.5
W21 x 12 ¹ / ₄	147	533	312	218.9	560	318	18.3	29.2
W21 x 12 ¹ / ₄	132	533	312	196.5	554	316	16.5	26.3
W21 x 12 ¹ / ₄	122	533	312	181.7	551	315	15.2	24.4
W21 x 12 ¹ / ₄	111	533	312	165.3	546	313	14	22.2
W21 x 12 ¹ / ₄	101	533	312	150.6	543	312	12.7	20.3
W21 x 8 ¹ / ₄	93	533	210	138.3	549	214	14.7	23.6
W21 x 8 ¹ / ₄	83	533	210	122	544.5	212	12.7	21.3
W21 x 8 ¹ / ₄	73	533	210	109	539.5	210.8	11.6	18.8
W21 x 8 ¹ / ₄	68	533	210	101	536.7	210	10.8	17.4
W21 x 8 ¹ / ₄	62	533	210	92.1	533.1	209.3	10.1	15.6
W21 x 6 ¹ / ₂	57	533	165	84.7	535	166	10.3	16.5
W21 x 6 ¹ / ₂	50	533	165	74.7	529	166	9.7	13.6
W21 x 6 ¹ / ₂	44	533	165	65.7	525	165	8.9	11.4
W18 x 11	234	457	280	349	535	296	29.5	53.6

5.3.1 American W-sections

Material to ASTM A36
Dimensions and properties to ASTM A6 & A992

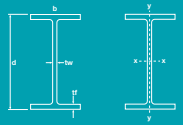


Designation	Mass per foot lb	Size in	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness Flange tf mm	
W18 x 11	211	457	280	314.7	525	293	26.9	48.5
W18 x 11	192	457	280	286.3	517	291	24.4	44.4
W18 x 11	175	457	280	261	509	289	22.6	40.4
W18 x 11	158	457	280	235.6	501	287	20.6	36.6
W18 x 11	143	457	280	213.3	495	285	18.5	33.5
W18 x 11	130	457	280	193.9	489	283	17	30.5
W18 x 11	119	457	280	177	482	286	16.6	26.9
W18 x 11	106	457	280	158	476	284	15	23.9
W18 x 11	97	457	280	144	472	283	13.6	22.1
W18 x 11	86	457	280	128	467	282	12.2	19.6
W18 x 11	76	457	280	113	463	280	10.8	17.3
W18 x 7 1/2	71	457	191	106.1	469	194	12.6	20.6
W18 x 7 1/2	65	457	191	98.3	467.2	192.8	11.4	19.6
W18 x 7 1/2	60	457	191	89.3	463.4	191.9	10.5	17.7
W18 x 7 1/2	55	457	191	82	460	191.3	9.9	16
W18 x 7 1/2	50	457	191	74.3	457	190.4	9	14.5
W18 x 6	46	457	152	67.2	458	153.8	9	15
W18 x 6	40	457	152	59.8	454.6	152.9	8.1	13.3
W18 x 6	35	457	152	52.3	449.8	152.4	7.6	10.9
W16 x 7	57	406	178	85	417	181	10.9	18.2
W16 x 7	50	406	178	74.2	412.8	179.5	9.5	16
W16 x 7	45	406	178	67.1	409.4	178.8	8.8	14.3
W16 x 7	40	406	178	60.1	406.4	177.9	7.9	12.8
W16 x 7	36	406	178	54.1	402.6	177.7	7.7	10.9
W16 x 5 1/2	31	406	140	46	403.2	142.2	6.8	11.2
W16 x 5 1/2	26	406	140	39	398	141.8	6.4	8.6
W14 x 16	730	356	406	1087.9	569	454	78	125
W14 x 16	665	356	406	991	550	448	71.9	115
W14 x 16	605	356	406	902.2	531	442	65.9	106
W14 x 16	550	356	406	819	514	437	60.5	97
W14 x 16	500	356	406	744.3	498	432	55.6	88.9
W14 x 16	455	356	406	677.8	483	428	51.2	81.5
W14 x 16	426	356	406	633.9	474.6	424	47.6	77
W14 x 16	398	356	406	592.6	465	421	45	72.3
W14 x 16	370	356	406	551	455.6	418.5	42.1	67.5
W14 x 16	342	356	406	509.5	446	416	39.1	62.7
W14 x 16	311	356	406	462.8	435	412	35.8	57.4
W14 x 16	283	356	406	421.7	425	409	32.8	52.6
W14 x 16	257	356	406	382.4	416	406	29.8	48
W14 x 16	233	356	406	347	407	404	27.2	43.7

Designation	Mass per foot lb	Size in	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness Flange tf mm	
W14 x 16	211	356	406	313.4	399	401	24.9	39.6
W14 x 16	193	356	406	287.1	393.6	399	22.6	36.5
W14 x 16	176	356	406	262.7	387	398	21.1	33.3
W14 x 16	159	356	406	235.1	381	394.8	18.4	30.2
W14 x 16	145	356	406	216.3	375	394	17.3	27.7
W14 x 14 1/2	132	356	368	196.5	372	374	16.4	26.2
W14 x 14 1/2	120	356	368	179.2	368	373	15	23.9
W14 x 14 1/2	109	356	368	162	364	371	13.3	21.8
W14 x 14 1/2	99	356	368	147.5	360	370	12.3	19.8
W14 x 14 1/2	90	356	368	134	356	369	11.2	18
W14 x 10	82	356	254	122.3	363	257	13	21.7
W14 x 10	74	356	254	110.4	360	256	11.4	19.9
W14 x 10	68	356	254	101.4	357	255	10.5	18.3
W14 x 10	61	356	254	91	353	254	9.5	16.4
W14 x 8	50	356	203	74.6	354	204	9.4	16.8
W14 x 8	45	356	203	67.1	350	204	8.6	15.1
W14 x 8	40	356	203	59.7	347	203	7.7	13.5
W14 x 6 3/4	38	356	171	57	358	172.2	8.1	13
W14 x 6 3/4	34	356	171	51	355	171.5	7.4	11.5
W14 x 6 3/4	30	356	171	45	351.4	171.1	7	9.7
W14 x 5	26	356	127	39.1	353.4	126	6.6	10.7
W14 x 5	22	356	127	33.1	349	125.4	6	8.5
W12 x 12	336	305	305	500.5	427.2	340	45.1	75.1
W12 x 12	305	305	305	454	415	336	41.3	68.7
W12 x 12	279	305	305	415.1	403	334	38.9	62.7
W12 x 12	252	305	305	374.8	391	330	35.4	57.2
W12 x 12	230	305	305	343.3	382	328	32.6	52.6
W12 x 12	210	305	305	313.2	373.6	324.9	30	48.3
W12 x 12	190	305	305	282.9	365.3	322.2	26.8	44.1
W12 x 12	170	305	305	252.9	356	319	24.4	39.6
W12 x 12	152	305	305	226.8	348	317	22.1	35.6
W12 x 12	136	305	305	202.6	341	315	20.1	31.8

5.3.1 American W-sections

Material to ASTM A36
Dimensions and properties to ASTMA6 & A992

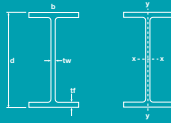


Designation	Mass per foot lb	Size in	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness Flange tf mm	
W12 x 12	120	305	305	178.8	333	313	18	28.1
W12 x 12	106	305	305	158.1	327.1	311.2	15.8	25
W12 x 12	96	305	305	143.1	323	309	14	22.9
W12 x 12	87	305	305	129.6	318	308	13.1	20.6
W12 x 12	79	305	305	117.9	314.5	307.4	12	18.7
W12 x 12	72	305	305	106.9	311	306	10.9	17
W12 x 12	65	305	305	96.9	307.9	305.3	9.9	15.4
W12 x 10	58	305	254	86.5	310	254	9.1	16.3
W12 x 10	53	305	254	79	306	254	8.8	14.6
W12 x 8	50	305	203	74.6	310	205	9.4	16.3
W12 x 8	45	305	203	67.1	306	204	8.5	14.6
W12 x 8	40	305	203	59.7	303	203	7.5	13.1
W12 x 6 1/2	35	305	165	52.4	317	167	7.6	13.2
W12 x 6 1/2	30	305	165	44.5	313	166	6.6	11.2
W12 x 6 1/2	26	305	165	38.7	310	165	5.8	9.7
W12 x 4	22	305	102	32.8	312.7	102.4	6.6	10.8
W12 x 4	19	305	102	28.2	308.7	101.8	6	8.8
W12 x 4	16	305	102	24.8	305.1	101.6	5.8	7
W12 x 4	14	305	102	21	303	101	5.1	5.7
W10 x 10	112	254	254	167.1	289.1	265.2	19.2	31.7
W10 x 10	100	254	254	148.9	282	263	17.3	28.4
W10 x 10	88	254	254	132	276.3	261.3	15.3	25.3
W10 x 10	77	254	254	114.8	269	259	13.5	22.1
W10 x 10	68	254	254	101.3	264.2	257.3	11.9	19.6
W10 x 10	60	254	254	88.9	260.3	256.3	10.3	17.3
W10 x 10	54	254	254	80.1	256.4	254.7	9.4	15.6
W10 x 10	49	254	254	73.1	254.1	254.6	8.6	14.2
W10 x 8	45	254	203	67.1	257	204	8.9	15.7
W10 x 8	39	254	203	58.2	252	203	8	13.5
W10 x 8	33	254	203	49.2	247	202	7.4	11
W10 x 5 3/4	30	254	146	44.8	265.9	147.6	7.6	13

Designation	Mass per foot lb	Size in	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness Flange tf mm	
W10 x 5 3/4	26	254	146	38.6	262.4	146.6	6.6	11.2
W10 x 5 3/4	22	254	146	32.8	258.3	146.1	6.1	9.1
W10 x 5 3/4	16	254	146	24	253	145	5	6.4
W10 x 4	19	254	102	28.3	260.4	102.2	6.3	10
W10 x 4	17	254	102	25.2	257.2	101.9	6	8.4
W10 x 4	15	254	102	22	254	101.6	5.7	6.8
W10 x 4	12	254	102	17.6	254	101.6	5.8	6.8
W8 x 8	67	203	203	99.6	228.6	210.3	14.5	23.7
W8 x 8	58	203	203	86.1	222.2	209.1	12.7	20.5
W8 x 8	48	203	203	71	215.8	206.4	10	17.3
W8 x 8	40	203	203	60	209.6	205.8	9.4	14.2
W8 x 8	35	203	203	52	206.2	204.3	7.9	12.5
W8 x 8	31	203	203	46.1	203.2	203.6	7.2	11
W8 x 6 1/2	28	203	133	41.7	205	166	7.2	11.8
W8 x 5 1/4	21	203	133	31.4	210	134	6.4	10.2
W8 x 5 1/4	18	203	133	26.6	207	133	5.8	8.4
W6 x 6	25	152	152	37	161.8	154.4	8	11.5
W6 x 6	20	152	152	30	157.6	152.9	6.5	9.4
W6 x 6	15	152	152	23	152.4	152.2	5.8	6.8
W6 x 4	16	152	100	24	160	102	6.6	10.3
W6 x 4	12	152	100	18	153	102	5.8	7.1
W6 x 4	9	152	100	13.5	150	100	4.3	5.5
W5 x 5	19	130	130	28.1	131	128	6.9	10.9
W5 x 5	16	130	130	23.8	127	127	6.1	9.1
W4 x 4	13	100	100	19.3	106	103	7.1	8.8

5.3.2 Jumbo sections

Material to ASTM A36
Dimensions and properties to ASTM A6 & A992



Corus is one of a select few manufacturing businesses that can produce the world's largest structural sections. The Jumbo sections are produced from ultra-clean steels and precision-rolled to the highest levels of dimensional accuracy. By working closely with some of the world's most prestigious construction companies, Corus offers the opportunity to build large structures faster, higher and stronger.

Some examples of major projects that have used Corus Jumbo Sections are:

- 383 Madison Avenue, New York, USA
- Jin Mao Building, Shanghai, China
- Petronas Towers, Kuala Lumpur, Malaysia
- Guangdong Olympic Stadium, Guangzhou, China
- Barclays Bank Headquarters, Canary Wharf, London

ASTM A992 Serial size in	Mass per foot lb	Serial size mm	Mass per metre kg/m	Depth Section d mm	Width Section b mm	Thickness of Web tw mm	Thickness of Flange tf mm
W14 x 16	730	356 x 406	1086.0	569.5	454.4	78	125
W14 x 16	665	356 x 406	990.0	549.7	448.3	71.9	115
W14 x 16	605	356 x 406	900.0	531.4	442.3	65.9	106
W14 x 16	550	356 x 406	818.0	514.1	436.9	60.5	97
W14 x 16	500	356 x 406	744.0	497.8	432.1	55.6	88.9
W14 x 16	455	356 x 406	677.0	483.1	427.6	51.2	81.5

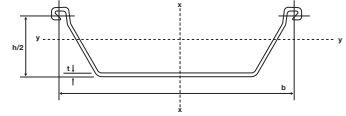
5.4 Piling

Corus International Projects is a supplier of piling products, including both sheet and tubular piles, enabling us to offer solutions for a wide variety of construction projects, both temporary and permanent. Typical structures include cofferdams, quays, wharves and harbour works, as well as land reclamation and retaining walls. This is complemented by a full range of interlocks, as well as corner, junction and closure piles to ensure a complete package can be supplied.

The sections are designed to offer the superior strength to weight ratio, whilst maintaining the best driving qualities. Sheet piles are typically supplied in accordance with EN 10248 grades S270GP and S355GP, although higher strength grades and weathering grades can be supplied. Sheet piles are available in Larssen, Z and straight web profiles and typical sizes and properties are shown in the table opposite. Tubular piles are

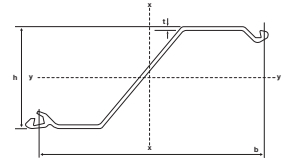
generally supplied in accordance with API-5L, whose sizes and properties are shown in Section 7.

Corus International Projects can offer technical assistance and advice in the design and application of piling systems through our expert piling engineers within the business. For further information contact us in Milton Keynes, UK.



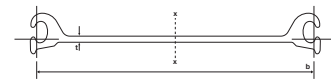
Larssen

section	width of one pile b mm	height of wall h mm	thickness of the pan t mm	mass kg/m ²	elastic section modulus W _{yy} cm ³ /m	Combined moment of Inertia I _{yy} cm ⁴ /m
L602	600	310	8.2	90.5	845	13075
L603	600	310	9.7	108	1180	18251
L603k	600	310	10	113.5	1220	18900
L604	600	380	10.5	123.5	1620	30726
L605	600	410	12.8	137.3	2006	41127
L606	600	420	16.5	158	2506	52631



Z piles

section	width of one pile b mm	height of one pile h mm	thickness of the pan t mm	mass kg/m ²	elastic section modulus W _{yy} cm ³ /m	Combined moment of Inertia I _{yy} cm ⁴ /m
Z22	560	235	9.5	107.3	989	11620
Z27	435	305	9.5	131.9	1665	25582
Z35	575	385	12.7	170.9	2631	50450
Z40	500	415	12.7	195.3	3296	68644
PZC 13	708	319	9.5	106	1300	20753
PZC 18	635	387	9.5	118.2	1801	34888



Straight web

section	width of one pile b mm	height of one pile h mm	thickness of the pan t mm	mass kg/m ²	elastic section modulus W _{yy} cm ³ /m	Combined moment of Inertia I _{yy} cm ⁴ /m
PS27.5	500	-	10.2	134.3	104	416
PS31	500	-	12.7	151.4	104	416

6.0 Hollow sections

6.1.1 Celsius® hot finished structural hollow sections

Celsius® SHS

- Formed at normalising temperature
 - High sectional properties
 - Fine grain structure
 - Uniform mechanical properties
 - Weldable in corner regions
-
- Higher compression capacity
 - Negligible residual stress
 - Tighter corner profile
 - Suitability for galvanising
 - Fire resistance capability
 - Proven dynamic performance

Celsius® hot finished structural hollow sections are produced in two standard grades, Celsius® 275 and Celsius® 355, which fully comply with EN 10210 S275J2H and EN 10210 S355J2H respectively.

Both grades have a Charpy impact minimum average energy of 27J at -20°C.

All Celsius® hot finished structural hollow sections have an improved corner profile of 2T maximum.

Celsius® SHS Specification

Corus manufactures its Celsius® SHS in accordance with the European Standard for hot finished structural hollow sections EN 10210, with the technical delivery requirements of EN 10210-1:1994 and the dimensions and tolerances to EN 10210-2:1997 plus an improved corner profile of 2T maximum. Celsius® 275 and Celsius® 355 are supplied as standard to quality J2 making them suitable for all internal and external applications to BS 5950-1:2000.

Celsius® hot finished structural hollow sections are produced by Electric Weld (EW) process in sizes up to and including 508mm outside diameter, 400 x 400mm square and 500 x 300mm rectangular. Details of the regular and non regular production sizes, thickness and grades are available.

A range of Jumbo RHS up to 800 x 800 x 60 are also available.

Sizes, thicknesses and grades other than those shown in this publication may be available on request.

Chemical Composition and Mechanical Properties

Chemical composition – ladle analysis

Specification	Celsius® 275	Celsius® 355
	EN 10210 S275J2H % max *	EN 10210 S355J2H % max *
Carbon	0.20	0.22
Silicon	–	0.55
Manganese	1.50	1.60
Sulphur	0.035	0.035
Phosphorus	0.035	0.035
Carbon equivalent (CEV) max T ≤ 16mm	0.41	0.45

* Up to and including 40mm thick

Mechanical properties

Specification	Celsius® 275	Celsius® 355
	EN 10210 S275J2H	EN 10210 S355J2H
Tensile Strength R_m N/mm²: 3 ≤ T ≤ 65mm	410 – 560	490 – 630
Yield Strength R_{eH} min. N/mm²: T ≤ 16mm	275	355
Min Elongation % T ≤ 40mm on gauge length 5.65. S₀	22	22
Impact properties		
Minimum Ave energy (J) 10 x 10mm Specimen at -20°C	27	27

6.1.1 Celsius® hot finished structural hollow sections

Square and rectangular hollow sections – length ranges and tolerances

Size Squares mm	Welded	
	Rectangles mm	Standard mill lengths m
40 x 40 uti 100 x 100	50 x 30 uti 120 x 80	6.0, 6.4, 7.5, 10.0 & 12.0
120 x 120 uti 150 x 150 x 12.5	150 x 100 uti 200 x 100 x 12.5	6.0, 6.4 7.5, 10.0 & 12.0
150 x 150 x 16.0		
160 x 160 to 400 x 400 x 16.0	200 x 120 to 450 x 250 x 16.0	10.0 & 12.0
	500 x 300 uti 16.0	10.0 & 12.0
400 x 400 x 20.0	500 x 300 x 20.0	8.5 – 9.2 randoms

Special mill lengths m	Tolerance mm	Seamless
		Standard random lengths m
5.4 – 14.6	+150-0	–
6.0 – 14.6	+150-0	–
		10 – 11.2
6.0 – 15.35	+150-0	–
6.0 – 15.15	+150-0	–
–	–	–

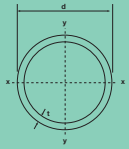
Circular hollow sections – length ranges and tolerances

Outside diameter mm	Welded	
	Thickness mm	Standard mill lengths m
21.3–42.4	all	6.0, 6.4 & 7.5
48.3	all	6.0, 6.4, 7.5 & 10.0
60.3–114.3	all	6.0, 6.4, 7.5 & 10.0
139.7	all	7.5, 10.0
168.3–193.7	all	7.5, 10.0 & 12.0
219.1–508.0	all	10.0 & 12.0

Special mill lengths m	Tolerance mm
5.4-7.5	+150-0
5.4-14.6	+150-0
5.0-14.6	+150-0
6.0-14.6	+150-0
6.0-14.6	+150-0
6.0-14.5	+150-0

6.1.2 Circular hollow sections

Dimensions and properties to EN 10210-1
Tolerances to EN 10210-2

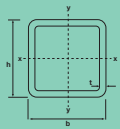


Outside diameter	Thickness	Mass	Sectional area	Approx. length/tonne
D mm	T mm	M kg/m	A cm ²	m/t
26.9	3.2	1.87	2.38	535
33.7	2.6	1.99	2.54	503
	3.2	2.41	3.07	415
	4.0	2.93	3.73	341
42.4	3.2	3.09	3.94	323
	4.0	3.79	4.83	264
48.3	3.2	3.56	4.53	281
	4.0	4.37	5.57	229
	5.0	5.34	6.80	187
60.3	3.2	4.51	5.74	222
	4.0	5.55	7.07	180
	5.0	6.82	8.69	147
76.1	2.9	5.24	6.67	191
	3.2	5.75	7.33	174
	4.0	7.11	9.06	141
	5.0	8.77	11.2	114
88.9	3.2	6.76	8.62	148
	4.0	8.38	10.7	119
	5.0	10.3	13.2	96.7
	6.3	12.8	16.3	77.9
114.3	3.2	8.77	11.2	114
	3.6	9.83	12.5	102
	4.0	10.9	13.9	92.0
	5.0	13.5	17.2	74.2
	6.3	16.8	21.4	59.6
139.7	5.0	16.6	21.2	60.2
	6.3	20.7	26.4	48.2
	8.0	26.0	33.1	38.5
	10	32.0	40.7	31.3
168.3	5.0	20.1	25.7	49.7
	6.3	25.2	32.1	39.7
	8.0	31.6	40.3	31.6
	10.0	39.0	49.7	25.6

Outside diameter	Thickness	Mass	Sectional area	Approx. length/tonne
D mm	T mm	M kg/m	A cm ²	m/t
193.7	5.0	23.3	29.6	43.0
	6.3	29.1	37.1	34.3
	8.0	36.6	46.7	27.3
	10.0	45.3	57.7	22.1
219.1	5.0	26.4	33.6	37.9
	6.3	33.1	42.1	30.2
	8.0	41.6	53.1	24.0
	10.0	51.6	65.7	19.4
244.5	12.5	63.7	81.1	15.7
	8.0	46.7	59.4	21.4
	10.0	57.8	73.7	17.3
273	12.5	71.5	91.1	14.0
	16.0	90.2	115	11.1
	6.3	41.4	52.8	24.1
323.9	8.0	52.3	66.6	19.1
	10.0	64.9	82.6	15.4
	12.5	80.3	102	12.5
	16.0	101	129	9.86
	6.3	49.3	62.9	20.3
355.6	8.0	62.3	79.4	16.0
	10.0	77.4	98.6	12.9
	12.5	96.0	122	10.4
	16.0	121	155	8.23
406.4	16.0	134	171	7.46
457	12.5	121	155	8.24
	16.0	154	196	6.49
508	16.0	174	222	5.75
	10.0	123	156	8.14
	12.5	153	195	6.55
	16.0	194	247	5.15

6.1.3 Square hollow sections

Dimensions and properties to EN 10210-1
Tolerances to EN 10210-2

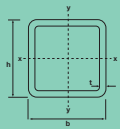


Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
20 x 20	1.5	0.4	0.5	2346
	2.3	0.7	0.8	1530
	3.0	0.9	1.1	1173
25.4 x 25.4	1.5	0.7	0.9	1455
	2.3	1.1	1.3	949
	3.0	1.4	1.7	727
30 x 30	1.5	1.0	1.2	1043
	2.3	1.5	1.9	680
	3.0	1.9	2.4	521
38.1 x 38.1	1.5	1.5	2.0	646
	2.3	2.4	3.0	422
	3.0	3.1	3.9	323
	3.2	3.3	4.2	303
40 x 40	1.5	1.7	2.2	587
	2.3	2.6	3.3	383
	3.0	3.41	4.34	293
	3.2	3.61	4.60	277
	4.0	4.39	5.59	228
	5.0	5.28	6.73	189
50 x 50	2.3	3.34	4.25	300
	3.0	4.35	5.54	230
	3.2	4.62	5.88	216
	3.6	5.08	6.47	197
	4.0	5.64	7.19	177
	5.0	6.85	8.73	146
	6.3	8.31	10.6	120
60 x 60	2.3	4.06	5.17	247
	3.0	5.29	6.74	189
	3.2	5.62	7.16	178
	3.6	6.21	7.91	161
	4.0	6.9	8.79	145
	5.0	8.42	10.7	119
	6.3	10.3	13.1	97
	8.0	12.5	16.0	80

Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
70 x 70	3.6	7.4	9.42	135
	5.0	9.99	12.7	100
	6.3	12.3	15.6	81
	8.0	15.0	19.2	67
75 x 75	2.3	5.43	6.91	184
	3.0	7.08	9.01	141
	3.2	7.55	9.61	132
	3.6	8.49	10.81	118
	4.0	9.44	12.02	106
	4.5	10.62	13.52	94
80 x 80	5.0	11.80	15.02	85
	3.6	8.53	10.9	117
	4.0	9.41	12.0	106
	5.0	11.6	14.7	86
90 x 90	6.3	14.2	18.1	70
	8.0	17.5	22.4	57
	3.6	9.66	12.3	104
	4.0	10.7	13.6	93
100 x 100	5.0	13.1	16.7	76
	6.3	16.2	20.7	62
	8.0	20.1	25.6	50
	2.3	6.84	8.74	146
100 x 100	3.0	8.93	11.40	112
	3.2	9.52	12.16	105
	3.6	10.71	13.68	93
100 x 100	4.0	11.9	15.2	84
	4.5	13.39	17.10	75
	5.0	14.7	18.7	68
	6.3	18.2	23.2	55
	8.0	22.6	28.8	44
	10.0	27.4	34.9	36
114.3 x 114.3	3.2	10.34	13.18	97
	3.6	11.63	14.83	86
	4.0	12.92	16.48	77
	4.5	14.53	18.54	69
	5.0	16.15	20.59	62
	6.0	19.38	24.71	52
	8.0	25.84	32.95	39
	9.0	29.07	37.07	34

6.1.3 Square hollow sections

Dimensions and properties to EN 10210-1
Tolerances to EN 10210-2

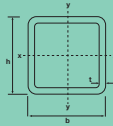


Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
120 x 120	5.0	17.8	22.7	56
	6.3	22.2	28.2	45
	8.0	27.6	35.2	36
	10.0	33.7	42.9	30
	12.5	40.9	52.1	25
125 x 125	3.2	8.96	11.39	112
	3.6	10.08	12.81	99
	4.0	11.20	14.24	89
	4.5	12.60	16.02	79
	5.0	14.00	17.80	71
	6.0	16.80	21.36	60
	8.0	22.40	28.48	45
135 x 135	3.2	12.50	15.89	80
	3.6	14.06	17.88	71
	4.0	15.62	19.86	64
	4.5	17.57	22.34	57
	5.0	19.53	24.83	51
	6.0	23.43	29.79	43
	8.0	31.24	39.72	32
	9.0	35.15	44.69	28
	10.0	39.05	49.65	26
	140 x 140	5.0	21.0	26.7
6.3		26.1	33.3	38
8.0		32.6	41.6	31
10.0		40.0	50.9	25
12.5		48.7	62.1	21
150 x 150	5.0	22.6	28.7	44
	6.3	28.1	35.8	36
	8.0	35.1	44.8	29
	10.0	43.1	54.9	23
	12.5	52.7	67.1	19
	16.0	65.2	83.0	15
160 x 160	5.0	24.1	30.7	42
	6.3	30.1	38.3	33
	8.0	37.6	48.0	27
	10.0	46.3	58.9	22
	12.5	56.6	72.1	18

Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne	
BxB mm	T mm	M kg/m	A cm ²	m/t	
175 x 175	3.6	20.76	26.44	48	
	4.0	23.06	29.38	43	
	4.5	25.95	33.05	39	
	5.0	28.83	36.73	35	
	6.0	34.60	44.07	29	
	8.0	46.13	58.76	22	
	9.0	51.90	66.11	19	
	10.0	57.66	73.45	17	
180 x 180	11.0	63.43	80.80	16	
	6.3	34.0	43.3	29	
	8.0	42.7	54.4	23	
	10.0	52.5	66.9	19	
	12.5	64.4	82.1	16	
200 x 200	16.0	80.2	102	13	
	4.0	24.32	30.96	41	
	4.5	27.36	34.83	37	
250 x 250	5.0	30.4	38.7	33	
	6.3	38.0	48.4	26	
	8.0	47.7	60.8	21	
	9.0	52.92	67.41	19	
	10.0	58.8	74.9	17	
	11.0	64.68	82.39	15	
	12.5	72.3	92.1	14	
	16.0	90.3	115	11	
	300 x 300	4.5	34.21	43.57	29
		5.0	38.02	48.41	26
6.3		47.9	61.0	21	
8.0		60.3	76.8	17	
9.0		67.05	85.41	15	
10.0		74.5	94.9	13	
11.0		81.95	104.39	12	
300 x 300	12.5	91.9	117	11	
	16.0	115	147	9	
	6.3	57.8	73.6	17	
	8.0	72.8	92.8	14	
	9.0	81.18	103.5	12	
	10.0	90.2	115	11	
	11.0	99.22	126.5	10	
	12.5	112	142	9	
	16.0	141	179	7	

6.1.3 Square hollow sections

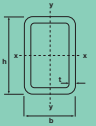
Dimensions and properties to EN 10210-1
Tolerances to EN 10210-2



Size diameter	Thickness	Mass	Sectional area	Approx. length/ tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
350 x 350	6.0	64.05	81.75	16
	8.0	85.4	109	12
	9.0	95.4	121.5	10
	10.0	106	135	9
	11.0	116.6	148.5	9
	12.5	131	167	8
	16.0	166	211	6
400 x 400	6.0	73.20	93.00	14
	8.0	97.60	124.00	10
	9.0	109.80	139.50	9
	10.0	122	155	8
	11.0	134.2	170.5	7
	12.5	151	192	7
	16.0	191	243	5
450 x 450	6.0	92.64	117.70	11
	8.0	123.53	156.94	8
	9.0	185.29	235.41	5
	10.0	308.81	392.34	3
	11.0	566.16	719.30	2
	12.5	1179.49	1498.54	1
	16.0	3145.31	3996.09	0.3

6.1.4 Rectangular hollow sections

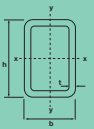
Dimensions and properties to EN 10210-1.
Tolerances to EN 10210-2



Size diameter	Thickness	Mass	Sectional area	Approx. length/ tonne
HxB mm	T mm	M kg/m	A cm ²	m/t
30 x 20	1.5	0.54	0.69	1839
	2.3	0.83	1.06	1199
	3.0	1.09	1.39	920
40 x 20	1.5	0.73	0.92	1379
	2.3	1.11	1.42	900
	3.0	1.45	1.85	690
40 x 30	1.5	1.09	1.39	920
	2.3	1.67	2.12	600
	3.0	2.18	2.77	460
50 x 25	1.5	1.13	1.44	883
	2.3	1.74	2.21	576
	3.0	2.27	2.89	441
	3.2	2.42	3.08	414
50 x 30	1.5	1.69	2.16	591
	2.3	2.59	3.31	385
	3.0	3.38	4.31	295
	3.2	3.61	4.60	277
60 x 40	1.5	2.18	2.77	460
	2.3	3.34	4.25	300
	3.0	4.35	5.54	230
	3.2	4.64	5.91	216
	4.0	5.64	7.19	177
	5.0	6.85	8.73	146
75 x 45	2.3	4.69	5.97	213
	3.0	6.12	7.79	163
	3.2	6.53	8.31	153
	3.6	7.34	9.35	136
	4.0	8.16	10.39	123
80 x 40	3.2	5.62	7.16	178
	4.0	6.9	8.79	145
	5.0	8.42	10.7	119
	6.3	10.3	13.1	97
	8.0	12.5	16.0	80

6.1.4 Rectangular hollow sections

Dimensions and properties to EN 10210-1.
Tolerances to EN 10210-2

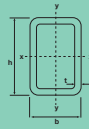


Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
HxB mm	T mm	M kg/m	A cm ²	m/t
90 x 50	3.6	7.4	9.42	135
	5.0	9.99	12.7	100
	6.3	12.3	15.6	82
100 x 50	2.3	5.14	6.55	194
	3.0	6.71	8.54	149
	3.2	7.13	9.08	140
	3.6	8.02	10.22	125
	4.0	8.78	11.2	114
	4.5	9.88	12.60	101
	5.0	10.8	13.7	93
	6.3	13.3	16.9	75
100 x 60	2.3	5.45	6.96	183
	3.0	7.11	9.08	141
	3.2	7.58	9.69	132
	3.6	8.53	10.9	117
	4.0	9.48	12.11	106
	4.5	10.66	13.63	94
	5.0	11.6	14.7	87
	6.3	14.2	18.1	70
100 x 80	2.3	7.27	9.29	138
	3.0	9.48	12.11	106
	3.2	10.11	12.92	99
	3.6	11.37	14.53	88
	4.0	12.64	16.15	79
	4.5	14.22	18.17	70
	5.0	15.80	20.19	63
	100 x 125	3.2	15.80	20.19
3.6		17.77	22.71	56
4.0		19.75	25.23	51
4.5		22.21	28.39	45
5.0		24.68	31.54	41
6.0		29.62	37.85	34
8.0		39.49	50.46	25
9.0		44.43	56.77	23

Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne	
HxB mm	T mm	M kg/m	A cm ²	m/t	
120 x 60	3.6	9.66	12.3	103	
	5.0	13.1	16.7	76	
	6.3	16.2	20.7	62	
	8.0	20.1	25.6	50	
120 x 80	5.0	14.7	18.7	68	
	6.3	18.2	23.2	55	
	8.0	22.6	28.8	44	
	10.0	27.4	34.9	37	
125 x 50	2.3	5.68	7.25	176	
	3.0	7.40	9.46	135	
	3.2	7.90	10.09	127	
	3.6	8.89	11.35	113	
	4.0	9.87	12.62	101	
	4.5	11.11	14.19	90	
150 x 100	5.0	12.34	15.77	81	
	5.0	18.6	23.7	54	
	6.3	23.1	29.5	43	
	8.0	28.9	36.8	35	
	10.0	35.3	44.9	28	
160 x 80	12.5	42.8	54.6	23	
	4.0	14.4	18.4	69	
	5.0	17.8	22.7	56	
	6.3	22.2	28.2	45	
	8.0	27.6	35.2	36	
200 x 100	10.0	33.7	42.9	30	
	3.6	16.27	20.66	32	
	4.0	18.08	22.96	35	
	4.5	20.34	25.83	40	
	5.0	22.6	28.7	44	
200 x 120	6.3	28.1	35.8	36	
	8.0	35.1	44.8	29	
	9.0	39.49	50.40	25	
	10.0	43.1	54.9	23	
	11.0	47.41	60.39	21	
	12.5	52.7	67.1	19	
	200 x 120	5.0	24.1	30.7	42
		6.3	30.1	38.3	33
8.0		37.6	48.0	27	
10.0		46.3	58.9	22	

6.1.4 Rectangular hollow sections

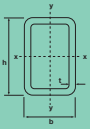
Dimensions and properties to EN 10210-1.
Tolerances to EN 10210-2



Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
HxB mm	T mm	M kg/m	A cm ²	m/t
200 x 150	8.0	41.4	52.8	24
	10.0	51.0	64.9	20
250 x 100	10.0	51.0	64.9	20
	12.5	62.5	79.6	16
250 x 150	5.0	30.4	38.7	33
	6.3	38.0	48.4	26
	8.0	47.7	60.8	21
	10.0	58.8	74.9	17
	12.5	72.3	92.1	14
	16.0	90.3	115	11
300 x 100	8.0	47.7	60.8	21
	10.0	58.8	74.9	17
300 x 200	6.3	47.9	61.0	21
	8.0	60.3	76.8	17
	10.0	74.5	94.9	13
	12.5	91.9	117	11
	16.0	115	147	9
400 x 200	8.0	72.8	92.8	14
	10.0	90.2	115	11
	12.5	112	142	9
	16.0	141	179	7

6.1.5 Jumbo rectangular hollow sections

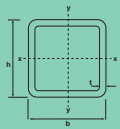
Dimensions and properties to JIS G3136



Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
HxB mm	T mm	M kg/m	A cm ²	m/t
450 x 250	8.0	85.4	109	12
	10.0	106	135	9
	12.5	131	167	8
	16.0	166	211	6
500 x 300	8.0	97.9	125	10
	10.0	122	155	8
	12.5	151	192	7
	16.0	191	243	5
	20.0	235	300	4

6.1.6 Jumbo square hollow sections

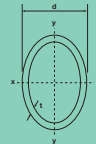
Dimensions and properties to JIS G3136



Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
350 x 350	19	190	242	5.26
	22	217	276	4.61
	25	242	309	4.12
400 x 400	22	251	320	3.98
	25	282	359	3.55
450 x 450	12	162	207	6.17
	16	213	271	4.70
	19	250	318	4.00
	22	286	364	3.50
	25	321	409	3.12
	28	355	452	2.82
	32	399	509	2.50
500 x 500	12	181	231	5.53
	16	238	303	4.20
	19	280	356	3.58
	22	320	408	3.12
	25	360	459	2.78
	28	399	508	2.51
	32	450	573	2.22
	36	498	635	2.01
550 x 550	16	263	335	3.80
	19	309	394	3.23
	22	355	452	2.82
	25	399	509	2.50
	28	443	564	2.26
	32	500	637	2.00
	36	555	707	1.80
	40	608	775	1.64
600 x 600	25	439	559	2.28
	28	487	620	2.05
	32	550	701	1.82
	36	611	779	1.64
	40	671	855	1.49
700 x 700	25	517	659	1.93
	28	575	732	1.74
	32	651	829	1.54
	36	724	923	1.38
	40	797	1015	1.26

Size diameter	Thickness	Mass	Sectional area	Approx. length/tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
800 x 800	25	596	759	1.68
	28	663	844	1.51
	32	751	957	1.33
	36	837	1067	1.19
	40	922	1175	1.08
	45	1026	1307	0.975
	50	1127	1436	0.887
	60	1321	1683	0.757

6.1.7 Celsius® Ovals



Celsius® Ovals

- Formed at normalising temperature
- High sectional properties
- Fine grain structure
- Uniform mechanical properties
- Fully weldable
- Negligible residual stress
- Suitability for galvanising

Celsius® 355 Ovals are produced in a standard grade, which fully complies with EN 10210 S355J2H. The grade has a Charpy impact minimum average energy of 27J at -20°C.

Celsius® 355 Ovals Specification

Corus manufactures its Celsius® Ovals in accordance with the technical delivery requirements and the tolerances of EN 10210 the European Standard for hot finished structural hollow sections. Celsius® 355 Ovals are supplied as standard to quality J2 making them suitable for all internal and external applications to BS 5950-1:2000.

Celsius® 355 Ovals are produced by the Electric Weld (EW) process in sizes from 150 x 75mm up to 500 x 250mm. Details of the sizes and thicknesses are shown on the following page.

Inspection and Testing

Celsius® 355 Ovals are submitted to specific inspection and testing, and supplied with an inspection certificate to EN 10204 type 3.1.

Designation

Celsius® 355 Ovals are designated by their outside dimensions and thickness in millimetres followed by their product standard and the material grade.

Examples:

Celsius® 355 Ovals 400 x 200 x 10.0 EN 10210 S355J2H

Dimensional tolerances

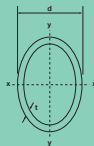
Specification	EN 10210 S355J2H
Outside dimension (B and H)	± 1% with a min of ± 0.5mm
Thickness (T)	- 10% Note. Positive deviation limited by mass tolerance
Mass (M)	± 6% on individual lengths
Straightness	Maximum 0.2% of the total length.
Length	+150mm-0

Celsius® 355 Ovals – sizes and thicknesses

Size mm	Thickness mm									Mill lengths
	3.2	3.6	4.0	5.0	6.3	8.0	10.0	12.5	16.0	
150 x 75										7.5, 10.0
200 x 100										7.5, 10.0, 12.0
250 x 125										7.5, 10.0, 12.0
300 x 150										10.0, 12.0
400 x 200										10.0, 12.0
500 x 250										10.0, 12.0

6.1.7 Celsius® Ovals

Dimensions and properties to EN 10210:Part 1
Tolerances EN 10210:Part 2



Size	Thickness	Mass	Area	Approx. Length /tonne
H x B mm	T mm	M kg/m	A cm ²	m/t
150 x 75	3.2	8.63	11.0	116
	3.6	9.67	12.3	103
	4.0	10.7	13.6	93.4
	5.0	13.3	16.9	75.4
	6.3	16.5	21.0	60.6
200 x 100	5.0	17.9	22.8	55.9
	6.3	22.3	28.4	44.8
	8.0	28.0	35.7	35.7
	10.0	34.5	44.0	29.0
	12.5	42.4	54.0	23.6
250 x 125	5.0	22.5	28.7	44.4
	6.3	28.2	35.9	35.5
	8.0	35.4	45.1	28.2
	10.0	43.8	55.8	22.8
	12.5	53.9	68.7	18.5
300 x 150	5.0	27.1	34.6	36.9
	6.3	34.0	43.3	29.4
	8.0	42.8	54.5	23.4
	10.0	53.0	67.5	18.9
	12.5	65.5	83.4	15.3
	16.0	82.5	105	12.1
400 x 200	5.0	36.4	46.3	27.5
	6.3	45.6	58.1	21.9
	8.0	57.6	73.4	17.4
	10.0	71.5	91.1	14.0
	12.5	88.6	113	11.3
	16.0	112	143	8.92
500 x 250	6.3	57.3	73.0	17.5
	8.0	72.4	92.2	13.8
	10.0	90.0	115	11.1
	12.5	112	142	8.95
	16.0	142	180	7.06

6.2.1 Strongbox® & Hybox® cold-formed structural hollow sections

Corus manufactures cold-formed structural hollow sections under two registered trade names Strongbox® and Hybox®.

The Strongbox® material, which provides a minimum yield strength of 235 N/mm², is manufactured in accordance with an internal Corus Tubes specification TS30 Rev1. It offers a consistent profile, which fully complies with the dimensional tolerances of EN10219, excluding mass. Hybox® 355 fully complies with the European Standard for cold formed structural hollow sections, EN10219 S355 J2H and is used in a wide range of construction and mechanical related applications including wind bracing and machinery.

Strongbox® 235 provides the strength with weldability, good galvanising characteristics and ease of manipulation that is needed for its use in a wide range of applications in the agricultural and engineering sectors. Hybox® 355 is classified as a high strength cold formed hollow section suitable for use in construction and mechanical applications where controlled specifications and associated design regulations apply.

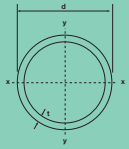
Strongbox® 235 is supplied as standard with a test report 2.2 to EN10204 and in standard lengths of 7.5 metres. Special mill lengths from 6 metres up to 14 metres are available by arrangement. Hybox® 355 is supplied with a test report 3.1B to EN10204. Standard lengths are 7.5 metres and 12.0 metres, with special mill lengths from 6 metres up to 18 metres available by arrangement.

Strongbox® 235 is available in sizes from 26.9 x 2.0 OD up to and including 139.7 x 6 OD in our circular hollow sections range and from 25 x 25 x 2.0 up to and including 150 x 150 x 8 and the equivalent rectangles in our rectangular hollow sections range.

Hybox®355 is available in sizes from 26.9 x 2.0 OD up to and including 508.0 x 16 OD in our circular hollow sections range and from 25 x 25 x 2.0 up to and including 300 x 300 x 12.5 and the equivalent rectangles in our rectangular hollow section range.

6.2.2 Cold-formed circular hollow sections

Dimensions and properties to EN 10219-1
Tolerances to EN 10219-2

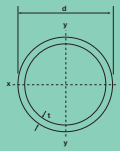


Outside Diameter	Thickness	Mass	Area	Approx. Length/Tonne
D mm	T mm	M kg/m	A cm ²	m/t
26.9	2.0	1.23	1.56	814
	2.5	1.50	1.92	665
	3.0	1.77	2.25	566
33.7	2.0	1.56	1.80	640
	2.5	1.92	2.45	520
	3.0	2.27	2.89	440
	4.0	2.93	3.40	341
42.4	2.5	2.46	3.13	407
	3.0	2.91	3.71	343
48.3	2.5	2.82	3.60	354
	3.0	3.35	4.27	298
	3.5	3.87	4.93	259
	4.0	4.37	5.57	229
60.3	3.0	4.24	5.40	236
	3.5	4.90	6.25	204
	4.0	5.55	7.07	180
76.1	2.5	4.54	5.78	220
	3.0	5.41	6.89	185
	3.5	6.27	7.22	160
	4.0	7.11	9.06	141
88.9	3.0	6.36	8.10	157
	3.5	7.37	9.39	136
	4.0	8.38	10.7	119
	5.0	10.3	13.2	96.7
114.3	3.0	8.23	10.5	121
	3.5	9.56	12.2	105
	4.0	10.9	13.9	91.9
	5.0	13.5	17.2	74.2
139.7	6.0	16.0	20.4	62.4
	4.0	13.4	17.1	74.7
	5.0	16.6	21.2	60.2
	6.0	19.8	25.2	50.5
	8.0	26.0	33.1	38.5
	10.0	32.0	40.7	31.3

Outside Diameter	Thickness	Mass	Area	Approx. Length/Tonne
D mm	T mm	M kg/m	A cm ²	m/t
168.3	4.0	16.2	20.6	61.7
	5.0	20.1	25.7	49.7
	6.0	24.0	30.6	41.6
	8.0	31.6	40.3	31.6
	10.0	39.0	49.7	25.6
	12.5	48.0	61.2	20.8
193.7	4.0	18.7	23.8	53.4
	4.5	21.0	26.7	47.6
	5.0	23.3	29.6	43.0
	6.0	27.8	35.4	36.0
	8.0	36.6	46.7	27.3
	10.0	45.3	57.7	22.1
	12.5	55.9	71.2	17.9
219.1	4.5	23.8	30.3	42.0
	5.0	26.4	33.6	37.9
	6.0	31.5	40.2	31.7
	8.0	41.6	53.1	24.0
	10.0	51.6	65.7	19.4
	12.0	61.3	78.1	16.3
	12.5	63.7	81.1	15.7
	16.0	80.1	102	12.5
244.5	5.0	29.5	37.6	33.9
	6.0	35.3	45.0	28.3
	8.0	46.7	59.4	21.4
	10.0	57.8	73.7	17.3
	12.0	68.8	87.7	14.5
	12.5	71.5	91.1	14.0
	16.0	90.2	115	11.1
273.0	5.0	33.0	42.1	30.3
	6.0	39.5	50.3	25.3
	8.0	52.3	66.6	19.1
	10.0	64.9	82.6	15.4
	12.0	77.2	98.4	12.9
	12.5	80.3	102	12.5
	16.0	101	129	9.86

6.2.2 Cold-formed circular hollow sections

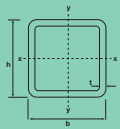
Dimensions and properties to EN 10219-1
Tolerances to EN 10219-2



Outside Diameter	Thickness	Mass	Area	Approx. Length/ Tonne
D mm	T mm	M kg/m	A cm ²	m/t
323.9	5.0	39.3	50.1	25.4
	6.0	47.0	59.9	21.3
	8.0	62.3	79.4	16.0
	10.0	77.4	98.6	12.9
	12.0	92.3	118	10.8
	12.5	96.0	122	10.4
	16.0	121	155	8.23
355.6	5.0	43.2	55.1	23.1
	6.0	51.7	65.9	19.3
	8.0	68.6	87.4	14.6
	10.0	85.2	109	11.7
	12.0	102	130	9.83
	12.5	106	135	9.45
	16.0	134	171	7.46
406.4	6.0	59.2	75.5	16.9
	8.0	78.6	100	12.7
	10.0	97.8	125	10.2
	12.0	117	149	8.57
	12.5	121	155	8.2
	16.0	154	196	6.5
457.0	6.0	66.7	85	15.0
	8.0	88.6	113	11.3
	10.0	110	140	9.07
	12.0	132	168	7.59
	12.5	137	175	7.30
	16.0	174	222	5.75
508.0	6.0	74.3	95	13.5
	8.0	98.6	126	10.1
	10.0	123	156	8.14
	12.0	147	187	6.81
	12.5	153	195	6.55
	16.0	194	247	5.15

6.2.3 Cold-formed square hollow sections

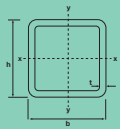
Dimensions and properties to EN 10219-1
Tolerances to EN 10219-2



Size	Thickness	Mass	Area	Approx. Length/ Tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
25 x 25	2.0	1.36	1.74	733
	2.5	1.64	2.09	610
	3.0	1.89	2.41	529
30 x 30	2.0	1.68	2.14	596
	2.5	2.03	2.59	492
	3.0	2.36	3.01	423
40 x 40	2.0	2.31	2.94	434
	2.5	2.82	3.59	355
	3.0	3.30	4.21	303
	4.0	4.20	5.35	238
50 x 50	2.0	2.93	3.74	341
	2.5	3.60	4.59	278
	3.0	4.25	5.41	236
	4.0	5.45	6.95	183
	5.0	6.56	8.36	152
60 x 60	2.0	3.56	4.09	281
	2.5	4.39	5.04	228
	3.0	5.19	6.61	193
	4.0	6.71	8.55	149
	5.0	8.13	10.4	123
70 x 70	2.5	5.17	6.59	193
	3.0	6.13	7.81	163
	3.5	7.06	8.99	142
	4.0	7.97	10.1	126
	5.0	9.70	12.4	103
80 x 80	3.0	7.07	9.0	141
	3.5	8.16	10.4	123
	4.0	9.22	11.7	108
	5.0	11.3	14.4	88.7
	6.0	13.2	16.8	75.7
90 x 90	3.0	8.01	10.2	125
	3.5	9.26	11.8	108
	4.0	10.5	13.3	95.4
	5.0	12.8	16.4	77.9
	6.0	15.1	19.2	66.2

6.2.3 Cold-formed square hollow sections

Dimensions and properties to EN 10219-1
Tolerances to EN 10219-2

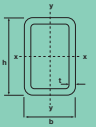


Size	Thickness	Mass	Area	Approx. Length/ Tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
100 x 100	3.0	8.96	11.4	112
	4.0	11.7	14.9	85.2
	5.0	14.4	18.4	69.4
	6.0	17.0	21.6	58.9
	8.0	21.4	27.2	46.8
120 x 120	4.0	14.2	18.1	70.2
	5.0	17.5	22.4	57.0
	6.0	20.7	26.4	48.2
	8.0	26.4	33.6	37.9
	10.0	31.8	40.6	31.4
140 x 140	4.0	16.8	21.3	59.7
	5.0	20.7	26.4	48.3
	6.0	24.5	31.2	40.8
	8.0	31.4	40.0	31.8
	10.0	38.1	48.6	26.2
150 x 150	4.0	18.0	22.9	55.5
	5.0	22.3	28.4	44.9
	6.0	26.4	33.6	37.9
	8.0	33.9	43.2	29.5
	10.0	41.3	52.6	24.2
160 x 160	4.0	19.3	24.5	51.9
	5.0	23.8	30.4	42.0
	6.0	28.3	36.0	35.4
	8.0	36.5	46.4	27.4
	10.0	44.4	56.6	22.5
180 x 180	5.0	27.0	34.4	37.1
	6.0	32.1	40.8	31.2
	8.0	41.5	52.8	24.1
	10.0	50.7	64.6	19.7
	12.0	58.5	74.5	17.1
	12.5	60.5	77.0	16.5
200 x 200	5.0	30.1	38.4	33.2
	6.0	35.8	45.6	27.9
	8.0	46.5	59.2	21.5
	10.0	57.0	72.6	17.6
	12.0	66.0	84.1	15.2
	12.5	68.3	87.0	14.6

Size	Thickness	Mass	Area	Approx. Length/ Tonne
BxB mm	T mm	M kg/m	A cm ²	m/t
250 x 250	6.0	45.2	57.6	22.1
	8.0	59.1	75.2	16.9
	10.0	72.7	92.6	13.8
	12.0	84.8	108	11.8
	12.5	88.0	112	11.4
300 x 300	8.0	71.6	91.2	14.0
	10.0	88.4	113	11.3
	12.0	104	132	9.65
	12.5	108	137	9.3

6.2.4 Cold-formed rectangular hollow sections

Dimensions and properties to EN 10219-1
Tolerances to EN 10219-2

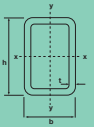


Size	Thickness	Mass	Area	Approx. Length /tonne
H x B mm	T mm	M kg/m	A cm ²	m/t
50 x 25	2.0	2.15	2.74	465
	2.5	2.62	3.34	382
	3.0	3.07	3.91	326
50 x 30	2.0	2.31	2.94	434
	2.5	2.82	3.59	355
	3.0	3.30	4.21	303
	4.0	4.20	5.35	238
60 x 30	3.0	3.77	4.81	265
	4.0	4.83	6.15	207
60 x 40	2.5	3.60	4.59	278
	3.0	4.25	5.41	236
	4.0	5.45	6.95	183
	5.0	6.56	8.36	152
70 x 40	3.0	4.72	6.01	212
	4.0	6.08	7.75	164
70 x 50	3.0	5.19	6.61	193
	4.0	6.71	8.55	149
80 x 40	3.0	5.19	6.61	193
	4.0	6.71	8.55	149
	5.0	8.13	10.4	123
80 x 50	3.0	5.66	7.21	177
	4.0	7.34	9.35	136
	5.0	8.91	11.4	112
80 x 60	3.0	6.13	7.81	163
	4.0	7.97	10.1	126
	5.0	9.70	12.4	103
	6.0	11.4	14.6	82
90 x 50	3.0	6.13	7.81	163
	3.5	7.06	8.99	142
	4.0	7.97	10.1	126
	5.0	9.70	12.4	103

Size	Thickness	Mass	Area	Approx. Length /tonne
H x B mm	T mm	M kg/m	A cm ²	m/t
100 x 40	3.0	6.13	7.81	163
	4.0	7.97	10.1	126
	5.0	9.70	12.4	103
100 x 50	3.0	6.60	8.41	152
	4.0	8.59	10.9	116
	5.0	10.5	13.4	95.4
	6.0	12.3	15.6	81.5
100 x 60	3.0	7.07	9.01	141
	3.5	8.16	10.4	123
	4.0	9.22	11.7	108
	5.0	11.3	14.4	88.7
100 x 80	3.0	8.01	10.2	125
	4.0	10.5	13.3	95.4
	5.0	12.8	16.4	77.9
120 x 40	3.0	7.07	9.01	141
	4.0	9.22	11.7	108
	5.0	11.3	14.4	88.7
120 x 60	3.0	8.01	10.2	125
	3.5	9.26	11.8	108
	4.0	10.5	13.3	95.4
	5.0	12.8	16.4	77.9
	6.0	15.1	19.2	66.2
120 x 80	4.0	11.7	14.9	85.2
	5.0	14.4	18.4	69.4
	6.0	17.0	21.6	58.9
	8.0	21.4	27.2	46.8
140 x 80	3.0	9.90	12.6	101
	4.0	13.0	16.5	77.0
	5.0	16.0	20.4	62.6
	6.0	18.9	24.0	53.0
	8.0	23.9	30.4	41.8
	10.0	28.7	36.6	34.8

6.2.4 Cold-formed rectangular hollow sections

Dimensions and properties to EN 10219-1
Tolerances to EN 10219-2



Size	Thickness	Mass	Area	Approx. Length /tonne
H x B mm	T mm	M kg/m	A cm ²	m/t
150 x 100	4.0	14.9	18.9	67.2
	5.0	18.3	23.4	54.5
	6.0	21.7	27.6	46.1
	8.0	27.7	35.2	36.0
	10.0	33.4	42.6	29.9
160 x 80	4.0	14.2	18.1	70.2
	5.0	17.5	22.4	57.0
	6.0	20.7	26.4	48.2
	8.0	26.4	33.6	37.9
180 x 80	4.0	15.5	19.7	64.5
	5.0	19.1	24.4	52.3
	6.0	22.6	28.8	44.2
	8.0	28.9	36.8	34.6
	10.0	35.0	44.6	28.6
180 x 100	4.0	16.8	21.3	59.7
	5.0	20.7	26.4	48.3
	6.0	24.5	31.2	40.8
	8.0	31.4	40.0	31.8
	10.0	38.1	48.6	26.2
200 x 100	4.0	18.0	22.9	55.5
	5.0	22.3	28.4	44.9
	6.0	26.4	33.6	37.9
	8.0	33.9	43.2	29.5
	10.0	41.3	52.6	24.2
200 x 120	4.0	19.3	24.5	51.9
	5.0	23.8	30.4	42.0
	6.0	28.3	36.0	35.4
	8.0	36.5	46.4	27.4
	10.0	44.4	56.6	22.5
200 x 150	4.0	21.2	26.9	47.3
	5.0	26.2	33.4	38.2
	6.0	31.1	39.6	32.1
	8.0	40.2	51.2	24.9
	10.0	49.1	62.6	20.4

Size	Thickness	Mass	Area	Approx. Length /tonne
H x B mm	T mm	M kg/m	A cm ²	m/t
250 x 150	5.0	30.1	38.4	33.2
	6.0	35.8	45.6	27.9
	8.0	46.5	59.2	21.5
	10.0	57.0	72.6	17.6
	12.0	66.0	84.1	15.2
	12.5	68.3	87.0	14.6
300 x 100	6.0	35.8	45.6	27.9
	8.0	46.5	59.2	21.5
	10.0	57.0	72.6	17.6
	12.5	68.3	87.0	14.6
300 x 200	6.0	45.2	57.6	22.1
	8.0	59.1	75.2	16.9
	10.0	72.7	92.6	13.8
	12.0	84.8	108	11.8
	12.5	88.0	112	11.4
400 x 200	8.0	71.6	91.2	14.0
	10.0	88.4	113	11.3
	12.0	104	132	9.6
	12.5	108	137	9.30

7.0 Pipe and tube products

7.1 Carbon steel linepipe and carbon and low alloy steel process pipe

Corus International Projects is a leading supplier of both welded (ERW / HFI / LSAW / SSAW) and seamless steel linepipe. We are able to offer quality pipes from a network of reputable manufacturers and stockists worldwide, including from our own Corus manufacturing pipe mills.

Corus International Projects has a long and successful track record supplying pipe & ancillary products to meet the needs of the customers we serve in the Oil & Gas and Petrochemical sectors. With in-house technical specialists and access to the Corus network of technical assistance, we can provide product and technical advice.

As a business we can deliver comprehensive pipe solutions, meeting the specific and bespoke needs of your project. This is achieved through project-managed packages of seamless and welded pipes, coatings and ancillaries. We can also resolve the complex logistics issues of supply in a global marketplace.

Mass per unit length can be calculated using the following equations for Carbon Steel pipe:

Metric, where D and t are measured in mm: $M (kg/m) = 0.02466 (D-t)t$

Imperial, where D and t are measured in inches: $M (lb/ft) = 10.68 (D-t)t$

Where D = outside diameter & t = thickness.

API work to 1 decimal place whereas ASME work to an accuracy of 2 decimal places.

Typical Grades Offered

	Welded	Seamless
ASTM	A53, A671, A672, A691	A53, A106, A333, A335
API	5L, 5LX, 5CT	5L, 5LX, 5CT
DIN	1626, 17172	1629, 17175
BS	3059, 3601, 3602	3601, 3602
EN	10208, 10217	10216
ISO	3183	3183

API – 5L

Nominal pipe size	Actual OD		Identification		Wall Thickness		Mass	
	in	mm	Schd		in	mm	lb/ft	kg/m
1/2	0.840	21.3	STD	40	0.109	2.77	0.85	1.27
1/2	0.840	21.3	XS	80	0.174	3.73	1.09	1.62
1/2	0.840	21.3	-	160	0.188	4.78	1.31	1.95
1/2	0.840	21.3	XXS	-	0.294	7.47	1.71	2.55
3/4	1.050	26.7	STD	40	0.113	2.87	1.13	1.69
3/4	1.050	26.7	XS	80	0.154	3.91	1.47	2.20
3/4	1.050	26.7	-	160	0.219	5.56	1.94	2.90
3/4	1.050	26.7	XXS	-	0.308	7.82	2.44	3.64
1	1.315	33.4	STD	40	0.133	3.38	1.68	2.50
1	1.315	33.4	XS	80	0.179	4.55	2.17	3.24
1	1.315	33.4	-	160	0.250	6.35	2.84	4.24
1	1.315	33.4	XXS	-	0.358	9.09	3.66	5.45
1 1/4	1.660	42.2	STD	40	0.140	3.56	2.27	3.39
1 1/4	1.660	42.2	XS	80	0.191	4.85	3.00	4.47
1 1/4	1.660	42.2	-	160	0.250	6.35	3.76	5.61
1 1/4	1.660	42.2	XXS	-	0.382	9.70	5.21	7.77
1 1/2	1.900	48.3	STD	40	0.145	3.68	2.72	4.07
1 1/2	1.900	48.3	XS	80	0.200	5.08	3.63	5.43
1 1/2	1.900	48.3	-	160	0.281	7.14	4.86	7.21
1 1/2	1.900	48.3	XXS	-	0.400	10.15	6.41	9.58
2	2.375	60.3	STD	40	0.154	3.91	3.65	5.42
2	2.375	60.3	XS	80	0.218	5.54	5.02	7.43
2	2.375	60.3	-	160	0.344	8.74	7.46	11.07
2	2.375	60.3	XXS	-	0.436	11.07	9.03	13.47
2 1/2	2.875	73.0	STD	40	0.203	5.16	5.79	8.69
2 1/2	2.875	73.0	XS	80	0.276	7.01	7.66	11.39
2 1/2	2.875	73.0	-	160	0.375	9.53	10.01	14.88
2 1/2	2.875	73.0	XXS	-	0.552	14.02	13.69	20.37
3	3.500	88.9	STD	40	0.216	5.49	7.58	11.29
3	3.500	88.9	XS	80	0.300	7.62	10.25	15.27
3	3.500	88.9	-	160	0.438	11.13	14.32	21.35
3	3.500	88.9	XXS	-	0.600	15.24	18.58	27.68
3 1/2	4	101.6	STD	40	0.226	5.74	9.11	13.57
3 1/2	4	101.6	XS	80	0.318	8.08	12.50	18.63
4	4.5	114.3	STD	40	0.237	6.02	10.79	16.07
4	4.5	114.3	XS	80	0.337	8.56	14.98	22.32
4	4.5	114.3	-	160	0.531	13.49	22.51	33.54
4	4.5	114.3	XXS	-	0.674	17.12	27.54	41.03
5	5.563	141.3	STD	40	0.258	6.55	14.62	21.77
5	5.563	141.3	XS	80	0.375	9.53	20.78	30.97
5	5.563	141.3	-	160	0.625	15.88	32.96	49.11
5	5.563	141.3	XXS	-	0.750	19.05	38.55	57.43

7.1 Carbon steel linepipe and carbon and low alloy steel process pipe

Nominal pipe size	Actual OD		Identification		Wall Thickness		Mass	
	in	mm	Schd	in	mm	lb/ft	kg/m	
6	6.625	168.3	STD	40	0.280	7.11	18.97	28.26
6	6.625	168.3	XS	80	0.432	10.97	28.57	42.56
6	6.625	168.3	-	160	0.719	18.26	45.35	67.56
6	6.625	168.3	XXS	-	0.864	21.95	53.16	79.22
8	8.625	219.1	STD	40	0.322	8.18	28.55	42.55
8	8.625	219.1	XS	80	0.500	12.70	43.39	64.64
8	8.625	219.1	XXS	-	0.875	22.23	72.42	107.92
8	8.625	219.1	-	160	0.906	23.01	74.69	111.27
10	10.750	273.1	STD	40	0.365	9.27	40.48	60.50
10	10.750	273.1	XS	60	0.500	12.70	54.74	81.55
10	10.750	273.1	-	80	0.594	15.09	64.93	96.01
10	10.750	273.1	XXS	-	1.000	25.40	104.13	155.15
10	10.750	273.1	-	160	1.250	28.58	115.64	172.44
12	12.750	323.9	STD	-	0.375	9.53	49.56	73.65
12	12.750	323.9	-	40	0.406	10.31	53.52	79.73
12	12.750	323.9	XS	-	0.500	12.70	65.42	97.46
12	12.750	323.9	-	80	0.688	17.48	88.63	132.08
12	12.750	323.9	XXS	-	1.000	25.40	125.49	186.97
12	12.750	323.9	-	160	1.312	33.32	160.27	238.63
14	14.000	355.6	STD	30	0.375	9.53	54.57	81.08
14	14.000	355.6	-	40	0.438	11.13	63.44	94.30
14	14.000	355.6	XS	-	0.500	12.70	72.09	107.39
14	14.000	355.6	-	80	0.750	19.05	106.13	158.49
14	14.000	355.6	-	160	1.406	35.71	189.11	281.63
16	16.000	406.4	STD	30	0.375	9.53	62.58	93.27
16	16.000	406.4	XS	40	0.500	12.70	82.77	123.30
16	16.000	406.4	-	80	0.844	21.44	136.61	203.53
16	16.000	406.4	-	160	1.594	40.49	245.25	365.35
18	18.000	457.0	STD	-	0.375	9.53	70.59	104.84
18	18.000	457.0	XS	-	0.500	12.70	93.45	139.15
18	18.000	457.0	-	40	0.562	14.27	104.67	156.11
18	18.000	457.0	-	80	0.938	23.83	170.92	254.55
18	18.000	457.0	-	160	1.781	45.24	308.50	459.37
20	20.000	508.0	STD	20	0.375	9.53	78.60	117.15
20	20.000	508.0	XS	30	0.500	12.70	104.13	155.12
20	20.000	508.0	-	40	0.594	15.09	123.11	183.42
20	20.000	508.0	-	80	1.031	26.19	208.87	311.17
20	20.000	508.0	-	160	1.956	50.01	379.17	564.81
22	22.000	559.0	STD	20	0.375	9.53	86.61	129.13
22	22.000	559.0	XS	30	0.500	12.70	114.81	171.09
22	22.000	559.0	-	80	1.125	28.58	250.81	373.83
22	22.000	559.0	-	160	2.125	53.98	451.06	672.26
24	24.000	610.0	STD	20	0.375	9.53	94.62	129.59
24	24.000	610.0	XS	-	0.500	12.70	125.49	187.06
24	24.000	610.0	-	40	0.688	17.48	171.29	255.41
24	24.000	610.0	-	80	1.219	30.96	296.58	442.08
24	24.000	610.0	-	160	2.344	59.54	542.13	808.22

Nominal pipe size	Actual OD		Identification		Wall Thickness		Mass	
	in	mm	Schd	in	mm	lb/ft	kg/m	
26	26.000	660.0	STD	-	0.375	9.53	102.63	152.39
26	26.000	660.0	XS	20	0.500	12.70	136.17	202.72
26	26.000	660.0	-	-	1.000	25.40	267.00	397.49
28	28.000	711.0	STD	-	0.375	9.53	110.64	164.34
28	28.000	711.0	XS	20	0.500	12.70	146.85	218.69
28	28.000	711.0	-	-	1.000	25.40	288.36	429.44
30	30.000	762.0	STD	-	0.375	9.53	118.65	179.29
30	30.000	762.0	XS	20	0.500	12.70	157.53	234.67
30	30.000	762.0	-	-	1.000	25.40	309.72	461.38
32	32.000	813.0	STD	-	0.375	9.53	126.66	188.24
32	32.000	813.0	XS	20	0.500	12.70	168.21	250.64
32	32.000	813.0	-	40	0.688	17.48	230.08	343.30
32	32.000	813.0	-	-	1.000	25.40	331.08	493.32
34	34.000	864.0	STD	-	0.375	9.53	134.67	200.18
34	34.000	864.0	XS	20	0.500	12.70	178.89	266.61
34	34.000	864.0	-	40	0.688	17.48	244.77	365.31
34	34.000	864.0	-	-	1.000	25.40	352.44	525.27
36	36.000	914.0	STD	-	0.375	9.53	142.68	211.90
36	36.000	914.0	XS	20	0.500	12.70	189.57	282.27
36	36.000	914.0	-	40	0.750	19.05	282.35	421.50
36	36.000	914.0	-	-	1.000	25.40	373.80	556.59
36	36.000	914.0	-	-	1.250	31.75	463.91	691.81
38	38.000	965.0	STD	-	0.375	9.53	150.69	223.84
38	38.000	965.0	XS	-	0.500	12.70	200.25	298.24
38	38.000	965.0	-	-	0.750	19.05	298.37	445.52
38	38.000	965.0	-	-	1.000	25.40	395.16	588.53
38	38.000	965.0	-	-	1.250	31.75	490.61	731.80
40	40.000	1016.0	STD	-	0.375	9.53	158.70	235.79
40	40.000	1016.0	XS	-	0.500	12.70	210.93	314.22
40	40.000	1016.0	-	-	0.750	19.05	314.39	469.55
40	40.000	1016.0	-	-	1.000	25.40	416.52	620.48
40	40.000	1016.0	-	-	1.250	31.75	517.31	770.62
42	42.000	1067.0	STD	-	0.375	9.53	166.71	248.52
42	42.000	1067.0	XS	-	0.500	12.70	221.61	330.19
42	42.000	1067.0	-	-	0.750	19.05	330.41	492.30
42	42.000	1067.0	-	-	1.000	25.40	437.88	652.42
42	42.000	1067.0	-	-	1.250	31.75	544.01	810.55
44	44.000	1118.0	STD	-	0.375	9.53	174.72	260.50
44	44.000	1118.0	XS	-	0.500	12.70	232.29	346.16
44	44.000	1118.0	-	-	0.750	19.05	346.43	516.26
44	44.000	1118.0	-	-	1.000	25.40	459.24	684.37
44	44.000	1118.0	-	-	1.250	31.75	570.71	850.48
46	46.000	1168.0	STD	-	0.375	9.53	182.73	272.25
46	46.000	1168.0	XS	-	0.500	12.70	242.97	351.82
46	46.000	1168.0	-	-	0.750	19.05	362.45	539.76
46	46.000	1168.0	-	-	1.000	25.40	480.60	715.68
46	46.000	1168.0	-	-	1.250	31.75	597.41	889.63

7.1 Carbon steel linepipe and carbon and low alloy steel process pipe

Nominal pipe size	Actual OD		Identification		Wall Thickness		Mass	
	in	mm	Schd	in	mm	lb/ft	kg/m	
48	48.000	1219.0	STD	-	0.375	9.53	190.74	284.24
48	48.000	1219.0	XS	-	0.500	12.70	253.65	377.79
48	48.000	1219.0	-	-	0.750	19.05	378.47	563.70
48	48.000	1219.0	-	-	1.000	25.40	501.96	747.63
48	48.000	1219.0	-	-	1.250	31.75	624.11	929.56
52	52.000	1321.0	-	-	0.375	9.53	206.76	307.25
52	52.000	1321.0	-	-	0.500	12.70	275.01	409.74
52	52.000	1321.0	-	-	0.750	19.05	410.51	613.20
52	52.000	1321.0	-	-	1.000	25.40	544.68	811.52
52	52.000	1321.0	-	-	1.250	31.75	677.51	1010.98
56	56.000	1422.0	-	-	0.375	9.53	222.78	331.94
56	56.000	1422.0	-	-	0.500	12.70	296.37	441.37
56	56.000	1422.0	-	-	0.750	19.05	442.55	660.77
56	56.000	1422.0	-	-	1.000	25.40	587.40	874.78
56	56.000	1422.0	-	-	1.250	31.75	730.91	1090.18
60	60.000	1524.0	-	-	0.375	9.53	238.80	355.92
60	60.000	1524.0	-	-	0.500	12.70	317.73	473.31
60	60.000	1524.0	-	-	0.750	19.05	474.59	708.82
60	60.000	1524.0	-	-	1.000	25.40	630.12	938.67
60	60.000	1524.0	-	-	1.250	31.75	784.31	1170.17
64	64.000	1626.0	-	-	0.375	9.53	254.82	379.89
64	64.000	1626.0	-	-	0.500	12.70	339.09	505.26
64	64.000	1626.0	-	-	0.750	19.05	506.63	756.86
64	64.000	1626.0	-	-	1.000	25.40	672.84	1002.56
64	64.000	1626.0	-	-	1.250	31.75	837.71	1250.15
68	68.000	1727.0	-	-	0.500	12.70	360.45	536.89
68	68.000	1727.0	-	-	0.750	19.05	538.67	804.43
68	68.000	1727.0	-	-	1.000	25.40	715.66	1065.82
68	68.000	1727.0	-	-	1.250	31.75	891.11	1329.36
72	72.000	1829.0	-	-	0.500	12.70	381.81	568.83
72	72.000	1829.0	-	-	0.750	19.05	570.71	852.47
72	72.000	1829.0	-	-	1.000	25.40	758.28	1129.69
72	72.000	1829.0	-	-	1.250	31.75	944.51	1409.34
76	76.000	1930.0	-	-	0.500	12.70	403.17	600.46
76	76.000	1930.0	-	-	0.750	19.05	602.75	900.05
76	76.000	1930.0	-	-	1.000	25.40	801.00	1192.97
76	76.000	1930.0	-	-	1.250	31.75	997.91	1488.55
80	80.000	2032.0	-	-	0.625	15.88	529.83	790.50
80	80.000	2032.0	-	-	0.750	19.05	634.79	948.09
80	80.000	2032.0	-	-	1.000	25.40	843.72	1256.86
80	80.000	2032.0	-	-	1.250	31.75	1051.31	1568.53
84	84.000	2133.0	-	-	0.625	15.88	556.53	829.07
84	84.000	2133.0	-	-	0.750	19.05	666.83	993.08
84	84.000	2133.0	-	-	1.000	25.40	886.44	1320.12
84	84.000	2133.0	-	-	1.250	31.75	1104.71	1645.18

7.2 Stainless and Duplex process pipe

These pipes can be supplied as seamless or welded, in a variety of steel grades. Full body stress relieving or normalising heat treatment can be undertaken as specified to meet the more onerous applications.

Mass per unit length can be calculated using the following equations for Stainless Steel pipe:

Metric, where D and t are measured in mm: M (kg/m) = 0.02466 ($D-t$) t

Where D = outside diameter & t = thickness.

The different grades of stainless steel permit considerable variations in weight. The ferritic stainless steels may be about 5% less, and the austenitic stainless steels about 2% greater than the values shown in this table, which are based on weights for carbon steel.

ANSI (ASTM)

Dimensions to ASME B36.19

Nominal pipe size	Actual OD		Identification	Wall Thickness		Mass	
	in	mm		in	mm	lb/ft	kg/m
1/8	0.405	10.3	10S	0.049	1.24	0.19	0.28
1/8	0.405	10.3	40S	0.065	1.73	0.24	0.37
1/8	0.405	10.3	80S	0.095	2.41	0.31	0.47
1/4	0.540	13.7	10S	0.065	1.65	0.33	0.49
1/4	0.540	13.7	40S	0.088	2.24	0.42	0.63
1/4	0.540	13.7	80S	0.119	3.02	0.54	0.80
3/8	0.675	17.1	10S	0.065	1.65	0.42	0.63
3/8	0.675	17.1	40S	0.091	2.31	0.57	0.84
3/8	0.675	17.1	80S	0.126	3.20	0.74	1.10
1/2	0.840	21.3	5S	0.065	1.65	0.54	0.81
1/2	0.840	21.3	10S	0.083	2.11	0.68	1.01
1/2	0.840	21.3	40S	0.109	2.77	0.87	1.29
1/2	0.840	21.3	80S	0.174	3.73	1.10	1.64
3/4	1.050	26.7	5S	0.065	1.65	0.69	1.03
3/4	1.050	26.7	10S	0.083	2.11	0.87	1.30
3/4	1.050	26.7	40S	0.113	2.87	1.15	1.71
3/4	1.050	26.7	80S	0.154	3.91	1.50	2.23
1	1.315	33.4	5S	0.065	1.65	0.88	1.31
1	1.315	33.4	10S	0.109	2.77	1.42	2.12
1	1.315	33.4	40S	0.133	3.38	1.71	2.54
1	1.315	33.4	80S	0.179	4.55	2.21	3.29
1 1/4	1.660	42.2	5S	0.065	1.65	1.13	1.68
1 1/4	1.660	42.2	10S	0.109	2.77	1.83	2.73
1 1/4	1.660	42.2	40S	0.140	3.56	2.31	3.44
1 1/4	1.660	42.2	80S	0.191	4.85	3.05	4.54
1 1/2	1.900	48.3	5S	0.065	1.65	1.30	1.93
1 1/2	1.900	48.3	10S	0.109	2.77	2.12	3.16
1 1/2	1.900	48.3	40S	0.145	3.68	2.76	4.11
1 1/2	1.900	48.3	80S	0.200	5.08	3.70	5.50
2	2.375	60.3	5S	0.065	1.65	1.63	2.42
2	2.375	60.3	10S	0.109	2.77	2.68	3.99
2	2.375	60.3	40S	0.154	3.91	3.71	5.52
2	2.375	60.3	80S	0.218	5.54	5.11	7.60

7.2 Stainless and Duplex process pipe

Nominal pipe size	Actual OD		Identification	Wall Thickness		Mass	
	in	mm		in	mm	lb/ft	kg/m
2 1/2	2.875	73.0	5S	0.083	2.11	2.52	3.75
2 1/2	2.875	73.0	10S	0.120	3.05	3.59	5.34
2 1/2	2.875	73.0	40S	0.203	5.16	5.89	8.77
2 1/2	2.875	73.0	80S	0.276	7.01	7.78	11.58
3	3.500	88.9	5S	0.083	2.11	3.08	4.59
3	3.500	88.9	10S	0.120	3.05	4.41	6.56
3	3.500	88.9	40S	0.216	5.49	7.71	11.47
3	3.500	88.9	80S	0.300	7.62	10.42	15.51
3 1/2	4	101.6	5S	0.083	2.11	3.53	5.26
3 1/2	4	101.6	10S	0.120	3.05	5.06	7.53
3 1/2	4	101.6	40S	0.226	5.74	9.26	13.78
3 1/2	4	101.6	80S	0.318	8.08	12.71	18.92
4	4.5	114.3	5S	0.083	2.11	3.98	5.93
4	4.5	114.3	10S	0.120	3.05	5.71	8.50
4	4.5	114.3	40S	0.237	6.02	10.97	16.32
4	4.5	114.3	80S	0.337	8.56	15.23	22.66
5	5.563	141.3	5S	0.109	2.77	6.46	9.61
5	5.563	141.3	10S	0.134	3.40	7.89	11.74
5	5.563	141.3	40S	0.258	6.55	14.85	22.10
5	5.563	141.3	80S	0.375	9.53	21.13	31.44
6	6.625	168.3	5S	0.109	2.77	7.71	11.48
6	6.625	168.3	10S	0.134	3.40	9.43	14.04
6	6.625	168.3	40S	0.280	7.11	19.29	28.70
6	6.625	168.3	80S	0.432	10.97	29.04	43.22
8	8.625	219.1	5S	0.109	2.77	10.08	15.00
8	8.625	219.1	10S	0.148	3.76	13.62	20.27
8	8.625	219.1	40S	0.322	8.18	29.03	43.20
8	8.625	219.1	80S	0.500	12.70	44.11	65.64
10	10.750	273.1	5S	0.134	3.40	15.43	22.96
10	10.750	273.1	10S	0.165	4.19	18.96	28.21
10	10.750	273.1	40S	0.365	9.27	41.15	61.24
10	10.750	273.1	80S	0.500	12.70	55.65	82.81
12	12.750	323.9	5S	0.156	3.96	21.31	31.72
12	12.750	323.9	10S	0.180	4.57	24.55	36.54
12	12.750	323.9	40S	0.322	9.53	50.41	75.02
12	12.750	323.9	80S	0.500	12.70	66.50	98.96
14	14.000	355.6	5S	0.156	3.96	23.43	34.87
14	14.000	355.6	10S	0.188	4.78	28.22	41.99
16	16.000	406.4	5S	0.165	4.19	28.36	42.20
16	16.000	406.4	10S	0.188	4.78	32.30	48.07
18	18.000	457.0	5S	0.165	4.19	31.93	47.51
18	18.000	457.0	10S	0.188	4.78	36.37	54.13
20	20.000	508.0	5S	0.188	4.78	40.47	60.23
20	20.000	508.0	10S	0.218	5.54	46.84	69.70
24	24.000	610.0	5S	0.218	5.54	56.34	83.85
24	24.000	610.0	10S	0.250	6.35	64.50	95.98
30	30.000	762.0	5S	0.250	6.35	80.74	120.15
30	30.000	762.0	10S	0.312	7.92	100.49	149.55

7.3 General purpose tube

BS 1387

Black

	Nominal Size (DN)	Designation	Outside Diameter (mm)		Thickness (mm)	Mass (kg/m)	
			max	min		Plain end	Screwed & Socketed
light	8	1/4	13.6	13.2	1.8	0.515	0.519
light	10	3/8	17.1	16.7	1.8	0.670	0.676
light	15	1/2	21.4	21.0	2.0	0.956	0.999
light	20	3/4	26.9	26.4	2.3	1.38	1.45
light	25	3/4	33.8	33.2	2.6	1.98	2.00
light	32	1 1/4	42.5	41.9	2.6	2.54	2.57
light	40	1 1/2	48.4	47.8	2.9	3.23	3.27
light	50	2	60.2	59.6	2.9	4.08	4.15
light	65	2 1/2	76.0	75.2	3.2	5.71	5.83
light	80	3	88.7	87.9	3.2	6.72	6.89
light	100	4	113.9	113.0	3.6	9.75	10.0
medium	8	1/4	13.9	13.3	2.3	0.641	0.645
medium	10	3/8	17.4	16.8	2.3	0.839	0.845
medium	15	1/2	21.7	21.1	2.6	1.21	1.22
medium	20	3/4	27.2	26.6	2.6	1.56	1.57
medium	25	1	34.2	33.4	3.2	2.41	2.43
medium	32	1 1/4	42.9	42.1	3.2	3.10	3.13
medium	40	1 1/2	48.8	48.0	3.2	3.57	3.61
medium	50	2	60.8	59.8	3.6	5.03	5.10
medium	65	2 1/2	76.6	75.4	3.6	6.43	6.55
medium	80	3	89.5	88.1	4.0	8.37	8.54
medium	100	4	114.9	113.3	4.5	12.2	12.5
medium	125	5	140.6	138.7	5.0	16.6	17.1
medium	150	6	166.1	164.1	5.0	19.7	20.3
heavy	8	1/4	13.9	13.3	2.9	0.765	0.769
heavy	10	3/8	17.4	16.8	2.9	1.02	1.03
heavy	15	1/2	21.7	21.1	3.2	1.44	1.45
heavy	20	3/4	27.2	26.6	3.2	1.87	1.88
heavy	25	1	34.2	33.4	4.0	2.94	2.96
heavy	32	1 1/4	42.9	42.1	4.0	3.80	3.83
heavy	40	1 1/2	48.8	48.0	4.0	4.38	4.42
heavy	50	2	60.8	59.8	4.5	6.19	6.26
heavy	65	2 1/2	76.6	75.4	4.5	7.93	8.05
heavy	80	3	89.5	88.1	5.0	10.3	10.5
heavy	100	4	114.9	113.3	5.4	14.5	14.8
heavy	125	5	140.6	138.7	5.4	17.9	18.4
heavy	150	6	166.1	164.1	5.4	21.3	21.9

7.3 General purpose tube

BS1387 Galvanized

	Nominal Size (DN)	Designation	Outside Diameter (mm)		Thickness (mm)	Mass (kg/m)	
			max	min		Plain end	Screwed & Socketed
light	8	1/4	13.6	13.2	1.8	0.547	0.551
light	10	3/8	17.1	16.7	1.8	0.711	0.717
light	15	1/2	21.4	21.0	2.0	0.999	1.010
light	20	3/4	26.9	26.4	2.3	1.45	1.46
light	25	1	33.8	33.2	2.6	2.06	2.08
light	32	1 1/4	42.5	41.9	2.6	2.65	2.70
light	40	1 1/2	48.4	47.8	2.9	3.35	3.39
light	50	2	60.2	59.6	2.9	4.24	4.31
light	65	2 1/2	76.0	75.2	3.2	5.91	6.03
light	80	3	88.7	87.9	3.2	6.95	7.13
light	100	4	113.9	113.0	3.6	10.0	10.3
medium	8	1/4	13.9	13.3	2.3	0.672	0.676
medium	10	3/8	17.4	16.8	2.3	0.879	0.886
medium	15	1/2	21.7	21.1	2.6	1.26	1.27
medium	20	3/4	27.2	26.6	2.6	1.63	1.64
medium	25	1	34.2	33.4	3.2	2.49	2.51
medium	32	1 1/4	42.9	42.1	3.2	3.21	3.24
medium	40	1 1/2	48.8	48.0	3.2	3.69	3.73
medium	50	2	60.8	59.8	3.6	5.18	5.26
medium	65	2 1/2	76.6	75.4	3.6	6.63	6.75
medium	80	3	89.5	88.1	4.0	8.60	8.78
medium	100	4	114.9	113.3	4.5	12.5	12.8
medium	125	5	140.6	138.7	5.0	17.0	17.5
medium	150	6	166.1	164.1	5.0	20.2	20.8
heavy	8	1/4	13.9	13.3	2.9	0.794	0.798
heavy	10	3/8	17.4	16.8	2.9	1.06	1.07
heavy	15	1/2	21.7	21.1	3.2	1.49	1.50
heavy	20	3/4	27.2	26.6	3.2	1.93	1.94
heavy	25	1	34.2	33.4	4.0	3.02	3.04
heavy	32	1 1/4	42.9	42.1	4.0	3.90	3.94
heavy	40	1 1/2	48.8	48.0	4.0	4.50	4.54
heavy	50	2	60.8	59.8	4.5	6.34	6.41
heavy	65	2 1/2	76.6	75.4	4.5	8.12	8.25
heavy	80	3	89.5	88.1	5.0	10.5	10.7
heavy	100	4	114.9	113.3	5.4	14.8	15.1
heavy	125	5	140.6	138.7	5.4	18.3	18.8
heavy	150	6	166.1	164.1	5.4	21.7	22.3

7.4 Pipe coatings

Corus International Projects, through their long history of supplying various coated products and worldwide relationships with coating applicators, can deliver all coating requirements, whether factory or site applied.

Reasons to Coat

Coatings are applied to steel surfaces for a variety of reasons, the main and most familiar reason is to protect the steel surface from corrosion.

Internal Coatings:

- Corrosion mitigation
- Flow improvement – hydraulic efficiency
- Galvanic corrosion protection – insulation

External Coatings:

- Corrosion mitigation
- Thermal insulation
- Weight coating – concrete

Types of Coatings

Various types of coating exist to cover the majority of applications:

- Varnish – short term protection (transit)
- Shop applied primer – longer term protection
- Epoxies – thermal set – two pack
- Phenolic – thermal setting – high temperature use
- Ceramic – very high temperature uses
- Polyethylene – long term corrosion protection
- Polypropylene – insulation coating
- Polyurethane – long term corrosion protection
- Coal Tar – coal enamel – long term corrosion protection
- Urethane – insulation coating
- Cement and mortar linings
- Polysiloxane coatings – very long term corrosion protection

Choice of Coatings

The choice of a particular type of coating is determined from:

- Environment (internal or external conditions)
- Service period required
- Functional or aesthetic
- Cost

7.4 Pipe coatings

Corrosion

There are various types of corrosion and methods to mitigate the effects of each.

- a. Internal Corrosion - caused by fluids, wet gas, Galvanic
- b. External Corrosion – caused by Galvanic action
- c. Stress Corrosion – caused by fluids/material choice
- d. Galvanic Corrosion – caused by dissimilar metals

Corrosion Mitigation

There are many methods of corrosion mitigation, the following are but a sample of the options available to the design engineer:

a. Choice of steel:

- High Alloy
- Controlled Hardness (NACE MR-01-75)
- Corrosion Resistant Alloy (CRA)
- CRA Clad material (Alloy 625/825 etc)
- Extra Thickness (Corrosion Allowance)

b. Choice of Protection:

- Corrosion Inhibitors & Biocides
- Protective Coatings
- Sacrificial Anodes

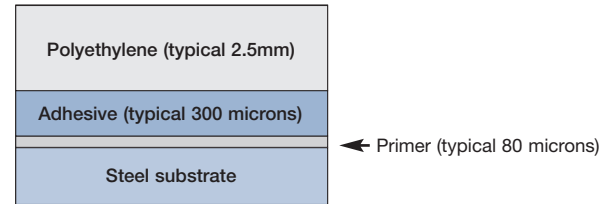
Relevant Coating Specifications

Polyethylene	DIN 30670 3.5mm nominal
Polypropylene	DIN 30678 3.5mm nominal
Fusion Bonded Epoxy	DIN 30671 150 – 600 microns

Handling/Shipping Considerations

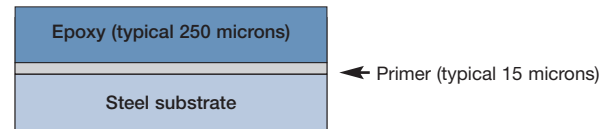
The handling, storage and shipping of coated products requires additional procedures, these may range from handling with webbing slings, special rack systems, boxing or special stowage considerations. Corus International Projects have the necessary expertise and logistics experience in handling coated products.

3-Layer Polyethylene Coating



Typical thickness = 3mm

Epoxy Coating



Typical thickness = 250 microns

8.0 Special profiles

8.1 Special profiles products

Corus has the capability to manufacture hot rolled, custom designed special profiles in steel, at Skinningrove in the UK and Mannstaedt near Cologne in Germany. The variety of industries that uses special profiles is almost as diverse as the product range itself. From construction through to shipbuilding, commercial vehicles, earthmoving, forklift trucks and elevators to name but a few. Our product range comprises over 2,000 profiles, giving us the most extensive scope in the world. We have the capability to design and manufacture profiles from under 1 kg/metre to 230 kg/metre, providing almost infinite possibilities.

In addition to hot rolling, we offer a range of processes, which reduce the amount of further work needed to make finished components:

- Cold drawing – profiles from 1kg/m to 45kg/m for high precision applications.
- Shot blasting.
- Heat treatment.
- Welding.
- Bending of profiles.
- A range of fabrication processes.

The use of special profiles improves component quality and performance as well as manufacturing efficiency. For example:

- They eliminate the costs of machining and welding.
- They have better dimensional accuracy compared with profiles made from other processes such as casting or forging.
- 'Lightweighting' by designing asymmetrical profiles, which place steel only where it is needed, they have more uniform mechanical properties compared with fabricated profiles.

8.2 Bulb flats

Bulb flats are tailor made for plate stiffening applications. Their special shape provides significant benefits compared with other types of stiffener. Bulb flats provide benefits during the initial steel construction phase, and also during the working life of a ship or other products on which they are used.

Bulb flats offer many unique benefits for achieving these objectives:

- They are "ready to use" plate stiffeners, bulb flats are more cost effective.
- The unique shape of a bulb flat distributes steel to maximize resistance to buckling.
- The compact shape of a bulb flat offers easy access for welding and painting.
- Bulb flats can also reduce coating material while maintaining the same section modulus.
- The rounded shape of a bulb flat provides inherent corrosion resistance features. It enhances drainage, and minimises dirt and moisture traps.

The advantages of bulb flats stretch beyond the initial building phase to provide benefits during the working life of a ship. Their shape has inherent corrosion resistance features, and they are more "user friendly" for repair and maintenance, compared with other stiffeners. Recognition of the benefits which bulb flats provide is resulting in increased usage in bridges around the world, both large and small. The advantages that bulb flats offer assist both the initial construction phase as well as the working life of the bridge.

8.2 Bulb flats

Width b [mm]	Thickness t [mm]	Mass/Unit Length G [kg/m]	Bulb Height c [mm]	Bulb Width d [mm]	Bulb Radius r [mm]
80	5	4.25	14	14.5	4
	6	4.88	14	14.5	4
100	7	6.86	15.5	16	4.5
	8	7.65	15.5	16	4.5
120	6	7.31	17	17.7	5
	7	8.25	17	17.7	5
	8	9.19	17	17.7	5
140	6.5	9.21	19	19.7	5.5
	7	9.74	19	19.7	5.5
	8	10.8	19	19.7	5.5
	10	13	19	19.7	5.5
160	7	11.4	22	22.2	6
	8	12.7	22	22.2	6
	9	14	22	22.2	6
	11.5	17.3	22	22.2	6
180	8	14.8	25	25.5	7
	9	16.2	25	25.5	7
	10	17.6	25	25.5	7
	11.5	19.7	25	25.5	7
200	8.5	17.8	28	28.8	8
	9	18.5	28	28.8	8
	10	20.1	28	28.8	8
	11	21.7	28	28.8	8
	12	23.2	28	28.8	8
220	9	21	31	32.1	9
	10	22.8	31	32.1	9
	11	24.5	31	32.1	9
	12	26.2	31	32.1	9
240	9.5	24.4	34	35.4	10
	10	25.4	34	35.4	10
	11	27.4	34	35.4	10
	12	29.3	34	35.4	10
260	10	28.3	37	38.7	11
	11	30.3	37	38.7	11
	12	32.4	37	38.7	11

Width b [mm]	Thickness t [mm]	Mass/Unit Length G [kg/m]	Bulb Height c [mm]	Bulb Width d [mm]	Bulb Radius r [mm]
280	10.5	32.4	40	42	12
	11	33.5	40	42	12
	12	35.7	40	42	12
	13	37.9	40	42	12
300	11	36.7	43	45.3	13
	12	39	43	45.3	13
	13	41.5	43	45.3	13
320	11.5	41.2	46	48.6	14
	12	42.5	46	48.6	14
	13	45	46	48.6	14
	14	47.5	46	48.6	14
340	12	46.1	49	52	15
	13	48.8	49	52	15
	14	51.5	49	52	15
	15	54.2	49	52	15
370	12.5	53.1	53.5	56.9	16.5
	13	54.6	53.5	56.9	16.5
	14	57.5	53.5	56.9	16.5
	15	60.5	53.5	56.9	16.5
	16	63.5	53.5	56.9	16.5
400	13	60.8	58	61.9	18
	14	63.9	58	61.9	18
	15	67	58	61.9	18
	16	70.2	58	61.9	18
	17	73.9	58	61.9	18
430	14	70.6	62.5	66.8	19.5
	15	73.9	62.5	66.8	19.5
	17	80.6	62.5	66.8	19.5
	20	90.8	62.5	66.8	19.5

