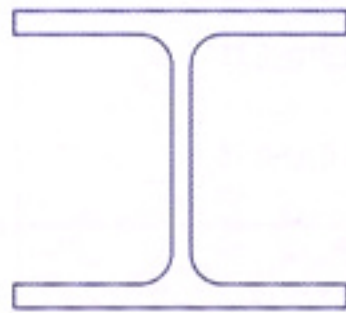
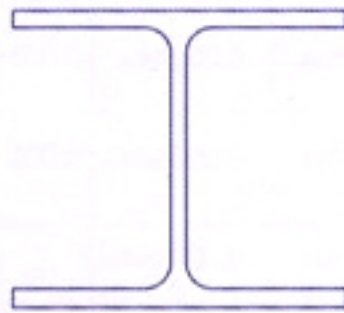


General

The section sizes of universal beams and columns are given in the tables on the following pages. We have split up the sections in metric and imperial sizes because the sections are rolled after different standard specifications. The tables cover I-beams, IPE-beams, H-beams and HE-beams. The difference between these beams is that the H/HE-beams have wider flange than the I/IPE-beams and therefore look more like the letter H than the letter I, see below. In our catalogue we put them all together to make it easier to make the ultimate choice.



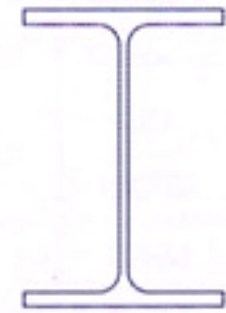
Heavy Column Sections. (H/HE)



Wide Flange Sections. Web height and flange width approximately equal. (H/HE)



Medium Flange Sections. (I/IPE)



Narrow Flange Sections. (I/IPE)

Universal Beams and Columns: Section shapes

The standard specifications used for production of universal beams and columns in this region are listed below:

Material	Yield strength N/mm ²			Tensile strength N/mm ²	Min. Elongation L ₀ =5.65√S ₀	Min. Charpy V-notch. Temp. 20 °C	Dimensions & Tolerances
	<12mm	12-40	>40mm				
AS 3679.1 (1996) Grade 250 Grade 300 Grade 350	260 300 360	250 300 340	230 300 330	min. 410 min. 430 min. 480	22% 22% 20%	27J 27J 27J	AS 3679.1 (1996)
ASTM A36 (1996) ASTM A572 (1997) Grade 42 Grade 42 Grade 50 Grade 65 ASTM A588 (1997)	min. 250 min. 290 min. 345 min. 415 min. 450 min. 345			400-550 min. 415 min. 450 min. 520 min. 550 min. 485	20-21% 20-24% 18-21% 16-18% 15-17% 18-21%	- - - - -	ASTM A6 (1997)
BS 4360 (1986) Grade 43A Grade 50A	min. 275 min. 355			430-580 490-640	22% 20%	27J 27J	BS 4 Part 1 (1993)
EN 10025 (1993) S275JR S355JR EN 10113 (1993) S275N S355N	≤16mm 275 355 ≤16mm 275 355	16-40 265 345 16-40 265 345	≥40mm 255 335 ≥40mm 255 335	3-100mm 410-560 490-630 3-100mm 370-510 470-630	17-22% 17-22% 24% 22%	10<t≤150mm 27J 27J 10<t≤150mm 27J 27J	EN 10034 (1993)
EN 3101 (1995) SS400 SS490 SS540 EN 3106 (1995) SM400A, B SM490A, B SM490YA, YB SM520B	≤16mm 245 285 400 ≤16mm 245 325 365 365	16-40 235 275 390 16-40 235 315 355 355	≥40mm 215 255 - ≥40mm 215 295 335 335	t<100mm 400-510 490-610 min 540 t<100mm 400-510 490-610 490-610 520-640	17-24% 15-21% 13-17% 18-24% 17-23% 15-21% 15-21%	- - - - - -	JIS 3192 (1994)

UNIVERSAL BEAMS AND COLUMNS - CHEMICAL COMPOSITION



Designation	Grade	Chemical Composition (%)								
		C	Si	Mn	P	S	Nb	V	CE*	N(ppm)**
ASTM A36	A36	0.26max	0.40max	-	0.040max	0.050max	-	-	-	-
ASTM A572	Grade 42	0.21max	0.40max	1.35max	0.040max	0.050max	0.005~0.050	0.010~0.15	-	-
	Grade 50	0.23max	0.40max	1.35max	0.040max	0.050max	0.005~0.050	0.010~0.15	-	-
ASTM A36 / A572G50	A36/ A57250	0.22max	0.40max	0.50-1.35	0.040max	0.050max	0.005~0.050	0.010~0.15	-	-
JIS G 3101	SS400	-	-	-	0.050max	0.050max	-	-	-	-
	SS490	-	-	-	0.050max	0.050max	-	-	-	-
JIS G 3106	SM400A	0.23max	-	C X 2.5min	0.035max	0.035max	-	-	-	-
	SM400B	0.20max	0.35max	0.60~1.40	0.035max	0.035max	-	-	-	-
	SM490A	0.20max	0.55max	1.60max	0.035max	0.035max	-	-	-	-
	SM490B	0.18max	0.55max	1.60max	0.035max	0.035max	-	-	-	-
	SM490YA	0.20max	0.55max	1.60max	0.035max	0.035max	-	-	-	-
	SM490YB	0.20max	0.55max	1.60max	0.035max	0.035max	-	-	-	-
	SM520B	0.20max	0.55max	1.60max	0.035max	0.035max	-	-	-	-
	EN 10025	S235JRG2	0.17max	-	1.40max	0.045max	0.045max	-	-	0.35max
	S275JR	0.21max	-	1.50max	0.045max	0.045max	-	-	0.40max	90max
	S275JO	0.18max	-	1.50max	0.040max	0.040max	-	-	0.40max	90max
	S355JR	0.24max	0.55max	1.60max	0.045max	0.045max	-	-	0.45max	90max
	S355JO	0.20max	0.55max	1.60max	0.040max	0.040max	-	-	0.45max	90max
DIN 17100	RST37-2	0.17max	-	-	0.050max	0.050max	-	-	-	90max
	ST44-2	0.21max	-	-	0.050max	0.050max	-	-	-	90max
BS 4360	40B	0.20max	0.50max	1.50max	0.050max	0.050max	-	-	-	-
	40C	0.18max	0.50max	1.50max	0.050max	0.050max	-	-	-	-
	43A	0.25max	0.50max	1.60max	0.050max	0.050max	-	-	-	-
	43B	0.22max	0.50max	1.50max	0.050max	0.050max	-	-	-	-
	43C	0.18max	0.50max	1.50max	0.050max	0.050max	-	-	-	-
	50A	0.23max	0.50max	1.60max	0.050max	0.050max	0.003~0.1	0.003~0.1	-	-
	50B	0.20max	0.50max	1.50max	0.050max	0.050max	0.003~0.1	0.003~0.1	-	-
	50C	0.20max	0.50max	1.50max	0.050max	0.050max	0.003~0.1	0.003~0.1	-	-

$$* CE = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

** It is permissible to exceed the specified values provided that for each increase of 10ppm N the P max. content will be reduced by 0.005% ; the N content of the ladle analysis, however, shall not be more than 120ppm.(1ppm=0.0001%)



1) ASTM A36, A572

Designation	Grade	tensile Test			
		Yield Point Min. MPa	Tensile Strength MPa	Test Piece inch	Elongation Min. %
ASTM A36	A36	250	400-500	8	20
ASTM A572	Grade 42	290	415 min	8	20
	Grade 50	345	450 min	8	18
A36/A572G50	A36/A57250	345	450-550	8	20

2) JIS G 3101, 3106

Rolled Steel for General Structure

JIS G 3101

Grade	Tensile Test						Bend Test			
	Yield Point or Yield Strength Min. Y / mm ²			Tensile Strength N / mm ²	Elongation			Bending Angle	Inside Radius of Bending	Test Piece
	Thickness. mm				Thickness mm	Test Piece	Min %			
	16 & under	over 16 to 40 incl.	Over 40							
SS 400	245	235	215	400-510	Shapes, flat bars, 5 & under in thickness	No. 5	21	180°	1.5X thickness	No. 1
					Shapes, flat bars, over 5 to 16, incl. in thickness	No. 1A	17			
					Shapes, flat bars, over 16 to 50, incl. in thickness	No. 1A	21			
					Shapes, flat bars, over 40 in thickness	No. 4	23			
SS 490	285	275	255	490-610	Shapes, flat bars, 5 & under in thickness	No. 5	19	180°	2.0X thickness	No. 1
					Shapes, flat bars, over 5 to 16, incl. in thickness	No.1A	15			
					Shapes, flat bars, over 16 to 50, incl. in thickness	No. 1A	19			
					Shapes, flat bars, over 40 in thickness	No. 4	21			

3) Rolled Steel for Welded Structure

JIS G 3106

Grade	Tensile Test							Impact Test			
	Yield Point or Yield Strength Min. Y / mm ²			Tensile Strength N / mm ²	Elongation			Grade	Tempe- rature °C	Charpy Absorbed Energy Min. Joule	Test Piece
	Thickness. mm				Thickness mm	Test Piece	min %				
	16 & under	over 16 to 40 incl.	Over 40	100 & under							
SM 400 A. B	245	235	215	400-510	5 & Under	No. 5	23	SM 400A	-	-	No. 4 in rolled direction
					Over 5 to 16 incl.	No. 1A	18	SM 400B	0	27	
SM 490 A. B	325	315	295	490-610	Over 16 to 50 incl.	No. 1A	22	SM 400A	-	-	
					Over 40	No. 4	24	SM 490B	0	27	
SM 490Y A. B	365	355	335	490-610	5 & Under	No. 5	9	SM 490YA	-	-	
					Over 5 to 16 incl.	No. 1A	15	SM 490YB	0	27	
SM 520 B	365	355	335	520-640	Over 16 to 50 incl.	No. 1A	19	SM 520B	0	27	
					Over 40	No. 4	21				



4) EN 10025, DIN 17100

Designation	Grade	Thickness mm	Tensile Test			Impact Test	
			Yield Point Min. N/mm ²	Tensile Strength Min. N/mm ²	Elongation Min, %	Temperature °C	Min. Joule
EN 10025	S235 JRG 2	≤16 >16, ≤40	235 225	340-470	26	20	27
	S275 JR	≤16 >16, ≤40	275 265	410-560	22	20	27
	S275 JO	≤16 >16, ≤40	275 265	410-560	22	0	27
	S355 JR	≤16 >16, ≤40	355 345	490-630	22	20	27
	S355 JO	≤16 >16, ≤40	355 345	490-630	22	0	27
DIN 17100	RST 37-2	≤16 >16, ≤40	235 225	340-470	26	20	27
	ST44-2	≤16 >16, ≤40	275 265	410-540	22	20	27

5) BS 4360

Grade	Thickness mm	Tensile Test			Impact Test	
		Yield Point Min. N/mm ²	Tensile Strength Min. N/mm ²	Elongation Min, %	Temperature °C	Min. Joule
40B	≤16 >16, ≤40	260 245	340-500	22	20	27
40C	≤16 >16, ≤40	260 245	340-500	22	0	27
43A	≤16 >16, ≤40	275 265	430-580	20	-	-
43B	≤16 >16, ≤40	275 265	430-580	20	20	27
43C	≤16 >16, ≤40	275 265	430-580	20	0	27
50A	≤16 >16, ≤40	355 345	490-640	18	-	-
50B	≤16 >16, ≤40	355 345	490-640	18	20	27
50C	≤16 >16, ≤40	355 345	490-640	18	0	27