

5. Bars

Steel bars are long steel products commonly used in construction and manufacturing, having a round, square or rectangular cross section.

- 5.1 Flat Bars
- 5.2 Round Bars
- 5.3 Square Bars

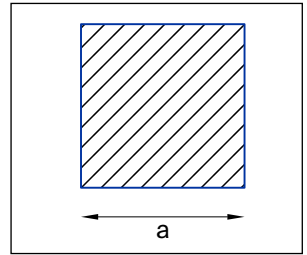
Bars

Standard specifications

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

Material	Yield strength			Tensile strength N/mm ²	Min. Elongation L ₀ =5.65√S ₀	Min. Charpy V-notch.	Dimensions & Tolerances
	N/mm ²						
AS 3679.1	≤11mm	>11 - <40mm	≥40mm				AS 3679.1
Grade 300	320	300	280	min. 440	22%	27J @ 0°C	
Grade 350	360	340	330	min. 480	20%	27J @ 0°C	
ASTM A36 (1996)	min. 250			400-550	20-21 %	-	ASTM A6
ASTM A572							
Grade 42	min. 290			min. 415	20-24 %	-	
Grade 50	min. 345			min. 450	18-21 %	-	
Grade 60	min. 415			min. 520	16-18 %	-	
Grade 65	min. 450			min. 550	15-17 %	-	
ASTM A992	345 - 450			min. 450	18-21 %	-	
EN 10025	≤16mm	>16 - ≤40mm	>40 - ≤150mm	3-100mm			EN 10058 - Flat EN 10059 - Square EN 10060 - Round
S275JR	275	265	255 - 225	410-560	18-23 %	27J @ 20°C	
S355JR	355	345	335 - 295	470-630	17-22 %	27J @ 20°C	
S355J0	355	345	335 - 295	470-630	17-22 %	27J @ 0°C	
S355J2	355	345	335 - 295	470-630	17-22 %	27J @ -20°C	
JIS 3101	≤16mm	>16 - ≤40mm	>40 - ≤100mm	t<100mm			JIS 3192
SS400	245	235	215	400-510	17-23 %	-	
SS490	285	275	255	490-610	15-21 %	-	
SS540	400	390	-	min. 540	13-17 %	-	
JIS 3106	≤16mm	>16 - ≤40mm	>40mm	t<100mm			
SM400A	245	235	215	400-510	18-24 %	-	
SM400B	245	235	215	400-510	18-24 %	27J @ 0°C	
SM400C	245	235	215	400-510	18-24 %	47J @ 0°C	
SM490A	325	315	295	490-610	17-23 %	-	
SM490B	325	315	295	490-610	17-23 %	27J @ 0°C	
SM490C	325	315	295	490-610	17-23 %	47J @ 0°C	
SM490YA	365	355	335	490-610	15-21 %	-	
SM490YB	365	355	335	490-610	15-21 %	27J @ 0°C	
SM520B	365	355	335	520-640	15-21%	27J @ 0°C	
SM520C	365	355	335	520-640	15-21 %	47J @ 0°C	

5.3 Square Bars



Dimensions EN10059/ ASTM A6

Specification EN10025/ ASTM A36/ ASTM A572

Size Range 8mm to 260mm

Designation		Area of Section	Second Moment of Inertia	Radius of Gyration	Elastic Modulus	Plastic Modulus	
Size a	Mass per Metre						
mm	kg/m	lb/ft	mm ²	mm ⁴	mm	mm ³	mm ³
9	0.64	0.43	81.0	547	2.60	121	182
10	0.79	0.53	100	833	2.89	167	250
12	1.13	0.76	144	1728	3.46	288	432
13	1.33	0.89	169	2380	3.75	366	549
16	2.01	1.35	256	5461	4.62	683	1024
18	2.54	1.71	324	8748	5.20	972	1458
19	2.83	1.90	361	10860	5.48	1143	1715
22	3.80	2.55	484	19520	6.35	1775	2662
25	4.91	3.30	625	32550	7.22	2604	3906
28	6.15	4.14	784	51220	8.08	3659	5488
30	7.07	4.75	900	67500	8.66	4500	6750
32	8.04	5.40	1024	87380	9.24	5461	8192
36	10.17	6.84	1296	140000	10.4	7776	11660
38	11.34	7.62	1444	173800	11.0	9145	13720
40	12.56	8.44	1600	213300	11.5	10670	16000
44	15.20	10.21	1936	312300	12.7	14200	21300
45	15.90	10.68	2025	341700	13.0	15190	22780
50	19.63	13.19	2500	520800	14.4	20830	31250
55	23.75	15.96	3025	762600	15.9	27730	41590
60	28.26	18.99	3600	1080000	17.3	36000	54000
65	33.17	22.29	4225	1488000	18.8	45770	68660
75	44.16	29.67	5625	2637000	21.7	70310	105500
80	50.24	33.76	6400	3413000	23.1	85330	128000
85	56.72	38.11	7225	4350000	24.5	102400	153500
90	63.59	42.73	8100	5468000	26.0	121500	182300
95	70.85	47.61	9025	6788000	27.4	142900	214300
100	78.50	52.75	10000	8333000	28.9	166700	250000