

ALFAHD STEEL
FOR
IMPORT & EXPORT



Stainless Steel Bar Round, Flat, Angle & Sections



Stainless steel bar comprises numerous products referred to by the shape, the section dimension, grade, condition and surface finish.

Shapes and Section Measurement



Round bar: measured across the diameter



Square bar: measured across the flats (A/F or AF)



Hexagonal bar: measured across the flats (A/F or AF)



Flat bar: measured width x thickness



Equal angle: measured leg length x thickness



Channels: measured flange width x web width x thickness



Hollow Bar: measured outside diameter (OD) x inside diameter (ID).
Some manufacturers describe as OD x Wall Thickness.

Grade

303, 304/304L, 316/316L, 321, 253MA, 416, 431, 2205, 630

Condition

H&T: Hardened and tempered

ANN: Annealed

PH: Precipitation hardened

Surface Finish

CD: Cold drawn

CG: Centreless ground

P&T: Peeled and turned

P: Polished

HF: Hot finished

RT: Rough turned / peeled

BD: Bright drawn

CF: Cold finished

ST: Smooth turned

SRE: Slit rolled edge

HRAP: Hot rolled annealed and pickled

PR: Peeled and reeled

Cold Finished is a generic term to cover: CD, CG, Peeled, Turned, BD and ST.

Dimensional Tolerances for Bar

Form and condition: Stainless Steel Bars				
Round			Square	Hexagonal
Centreless ground	Bright/Cold drawn	Cold finished/smooth turned		
h8 or h9	h9	h10	h11	h11

Note: Round bar stocked in sizes above 101.6mm is usually in a Rough Turned (Peeled) condition with an all-plus diameter tolerance.

Nominal bar size (mm)	Tolerance Number								
	6*	7*	8	9	10	11	12	13	14*
Up to 3	0.006	0.010	0.014	0.025	0.040	0.060	0.10	0.14	0.25
over 3 to 6	0.008	0.012	0.018	0.030	0.048	0.075	0.12	0.18	0.30
over 6 to 10	0.009	0.015	0.022	0.036	0.058	0.090	0.15	0.22	0.36
over 10 to 18	0.011	0.018	0.027	0.043	0.070	0.110	0.18	0.27	0.43
over 18 to 30	0.013	0.021	0.033	0.052	0.084	0.130	0.21	0.33	0.52
over 30 to 50	0.016	0.025	0.039	0.062	0.100	0.160	0.25	0.39	0.62
over 50 to 80	0.019	0.030	0.046	0.074	0.120	0.1490	0.30	0.476	0.74
over 80 to 120	0.022	0.035	0.054	0.087	0.140	0.220	0.35	0.54	0.87
over 120 to 180	0.025	0.040	0.063	0.100	0.160	0.250	0.40	0.63	1.00
over 180 to 250	0.029	0.046	0.072	0.115	0.185	0.290	0.46	0.72	1.15
over 250 to 315	0.032	0.052	0.081	0.130	0.210	0.320	0.52	0.81	1.30
over 315 to 400	0.036	0.057	0.089	0.140	0.230	0.360	0.57	0.89	1.40
over 400 to 500	0.040	0.063	0.097	0.155	0.250	0.400	0.63	0.97	1.55

Notes

Units are millimetres

h = all minus, k = all plus

* This table shows h tolerances across all tolerance classes.

k tolerances are in accordance with this table for tolerance classes k8 to k13 only.

k tolerances are not standardized for k14 and above.

Examples

25.40mm diameter bright drawn bar to h9 tolerance = +nil, -0.052mm

90mm diameter peeled bar to k12 tolerance = +0.35, -nil

Common Stainless Steel Bar Specifications

ASTM A276M	Hot or cold finished bar except bars for reforging (see ASTM A314). Includes rounds, squares, hexagons, hot rolled or extruded shapes such as angles, flats, channels and commonly used grades of stainless steel, including 'improved machinability'. Free machining grades such as 303 and 416 are not included (see spec. A582/A582M).
ASTM A479M	This specification covers the same sections as ASTM A276M, for use in pressure vessel construction. Also referred to in ASME boiler and pressure vessel code.
ASTM A582M	Hot or cold finished free-machining stainless steel bar (except bars for forging), primarily grades 303 and 416. These high sulphur grades have excellent machinability but reduced corrosion resistance, formability and weldability.
ASTM A484M	General requirements for stainless steel wrought bars, shapes, forgings and billets, under each ASTM specification.

Stainless Steel Round Bar – ASTM A276M

Condition: 25.4mm and less generally drawn, above 25.4mm and less than 101.6mm is generally annealed, turned and polished. Sizes above 101.6mm are generally rough turned to an all-plus tolerance

Grades: 431 and 2205 are often stocked in a smooth turned or centreless ground finish.

Diameter		Weight (kg/m)	Diameter		Weight (kg/m)
mm	inches		mm	Inches	
3.00	0.118	0.06	31.75	1.250	6.22
3.18	0.125	0.06	34.92	1.375	7.53
3.97	0.156	0.10	35.00	1.378	7.56
4.00	0.157	0.10	36.00	1.417	8.00
4.76	0.187	0.14	38.10	1.500	8.96
4.90	0.193	0.15	40.00	1.575	9.88
5.00	0.197	0.15	41.27	1.625	10.51
6.00	0.236	0.22	44.45	1.750	12.20
6.35	0.250	0.25	50.00	1.969	15.43
7.94	0.313	0.39	50.80	2.000	15.93
8.00	0.315	0.39	53.97	2.125	17.98
9.00	0.354	0.50	57.15	2.250	20.16
9.52	0.375	0.56	60.00	2.362	22.22
10.00	0.394	0.62	63.50	2.500	24.89
11.11	0.437	0.76	69.85	2.750	30.12
12.00	0.472	0.89	76.20	3.000	35.84
12.70	0.500	1.01	82.55	3.250	42.07
14.00	0.551	1.21	88.90	3.500	48.79
14.28	0.562	1.26	95.25	3.750	56.00
15.87	0.625	1.55	100.00	3.937	61.73
16.00	0.630	1.58	101.60	4.000	63.72
17.46	0.687	1.88	114.30	4.500	80.65
18.00	0.709	2.00	127.00	5.000	99.56
19.05	0.750	2.24	140.00	5.512	120.99
20.00	0.787	2.47	152.40	6.000	143.37
22.00	0.866	2.99	165.00	6.496	168.06
22.23	0.875	3.05	177.80	7.000	195.15
24.00	0.945	3.56	203.20	8.000	254.89
25.00	0.984	3.86	205.00	8.071	259.42
25.40	1.000	3.98	228.60	9.000	322.59
28.58	1.125	5.04	254.00	10.000	398.26
30.00	1.181	5.56	304.80	12.000	573.80

Flat Bar – ASTM A276M

Finish: HRAP or SRE

Grades: 304, 316

Width (mm)	Thickness (mm)	Weight (kg/m)
12.00	3.00	0.29
	6.00	0.59
20.00	3.00	0.49
	5.00	0.82
	6.00	0.98
	10.00	1.63
25.00	3.00	0.61
	5.00	1.02
	6.00	1.23
	8.00	1.63
	10.00	2.04
	12.00	2.45
30.00	3.00	0.74
	5.00	1.23
	6.00	1.47
	8.00	1.96
	10.00	2.45
	12.00	2.94
40.00	3.00	0.98
	5.00	1.63
	6.00	1.96
	8.00	2.62
	10.00	3.27
	12.00	3.92
50.00	3.00	1.23
	5.00	2.04
	6.00	2.45
	8.00	3.27
	10.00	4.09
	12.00	4.91
	16.00	6.54
	20.00	8.18
	25.00	10.22

Width (mm)	Thickness (mm)	Weight (kg/m)	
65.00	5.00	2.66	
	6.00	3.19	
	8.00	4.25	
	10.00	5.31	
75.00	12.00	6.38	
	5.00	3.07	
	6.00	3.68	
	8.00	4.91	
75.00	10.00	6.13	
	12.00	7.36	
	16.00	9.81	
	20.00	12.27	
	25.00	15.33	
	100.00	6.00	4.91
		8.00	6.54
		10.00	8.18
12.00		9.81	
16.00		13.08	
20.00		16.35	
25.00		20.44	
150.00	6.00	7.36	
	10.00	12.27	
	12.00	14.72	

HRAP – Hot rolled, annealed and pickled.

SRE – Slit rolled edge.

Size Ranges:

SRE – up to 5mm thick, all widths

SRE – 6mm thick up to and including 40mm width

HRAP – 6mm thick, 50mm and wider

HRAP – all thicknesses above 6mm

Lengths:

All SRE is 4mm long

All HRAP is 6mm long

Angle Bar – ASTM A276MCondition: HRAP
Grades 304, 316

Leg length		Thickness (mm)	Weight (kg/m)
mm	mm		
20.00	20.00	3.00	0.90
25.00	25.00	3.00	1.10
		5.00	1.80
		6.00	2.10
30.00	30.00	3.00	1.30
		4.00	1.80
		5.00	2.20
		6.00	2.05
40.00	40.00	3.00	1.80
		4.00	2.40
		5.00	2.90
		6.00	3.50
50.00	50.00	3.00	2.30
		4.00	3.00
		5.00	3.70
		6.00	4.40
		10.00	7.10
65.00	65.00	6.00	5.80
		10.00	9.40
75.00	75.00	6.00	6.80
		10.00	9.40
100.00	100.00	6.00	9.10
		10.00	14.90
		12.00	17.70

Hexagonal Bar – ASTM A276MCondition: cold drawn
Grades 303,316

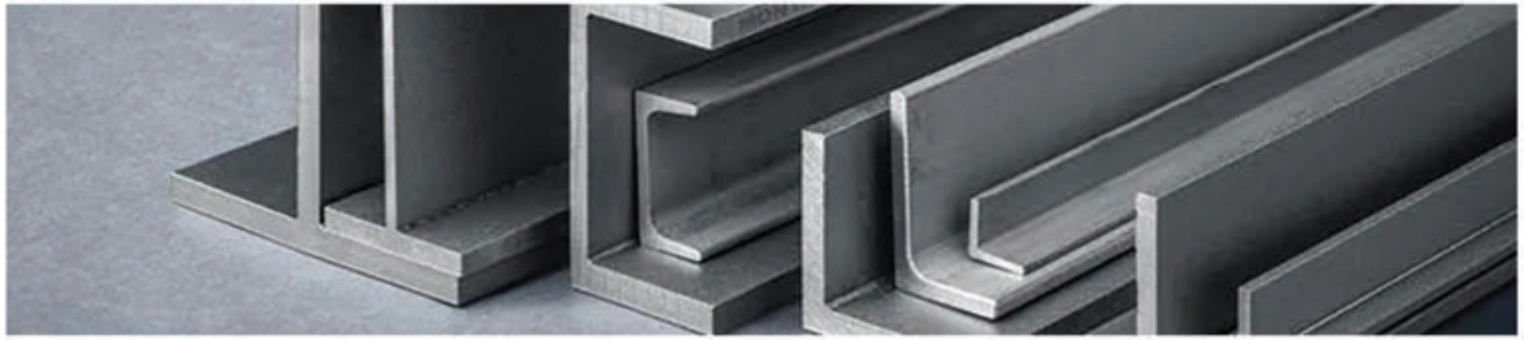
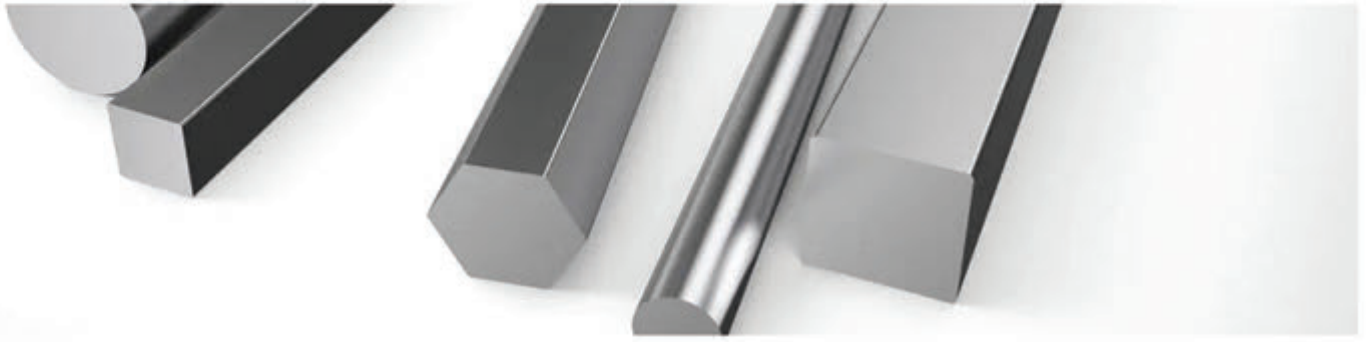
'AF' across flats		Weight (kg/m)
mm	inches	
6.35	0.250	0.27
7.93	0.312	0.43
8.00	0.315	0.44
9.53	0.375	0.62
11.11	0.437	0.84
13.34	0.525	1.21
15.27	0.601	1.59
18.03	0.710	2.21
19.05	0.750	2.47
20.83	0.820	2.95
22.00	0.866	3.29
22.23	0.875	3.36
23.37	0.920	3.72
24.00	0.945	3.92
25.65	1.010	4.48
28.58	1.125	5.56
30.00	1.181	6.13
30.48	1.200	6.32
31.75	1.250	6.86
33.05	1.300	7.42
34.92	1.374	8.30
37.59	1.479	9.59
38.10	1.500	9.93
42.42	1.670	12.22
47.63	1.875	15.40
50.80	2.000	17.52
57.15	2.250	22.17
63.50	2.500	27.37

Square Bar – ASTM A276MCondition: cold drawn
Grades 304, 316

'AF' across flats		Weight (kg/m)
mm	inches	
6.00	0.240	0.28
6.35	0.250	0.32
8.00	0.310	0.50
9.52	0.370	0.71
10.00	0.930	0.78
12.00	0.470	1.13
12.70	0.500	1.26
14.00	0.550	1.54
15.88	0.630	1.98
16.00	0.630	2.01
19.05	0.750	2.84
20.00	0.790	3.14
25.00	0.980	4.90
25.40	1.000	5.06
31.75	1.250	7.90
32.00	1.260	8.03
38.10	1.500	11.38
40.00	1.570	12.54
50.80	2.000	20.23

Channels– ASTM A276MCondition: HRAP
Grades 304,316

Web (mm)	Flange (mm)	Thickness (mm)	Weight (kg/m)
50.0	25.0	3.0	2.2
80.0	40.0	5.0	6.0
100.0	50.0	4.0	6.2
100.0	50.0	5.0	7.6
100.0	50.0	6.0	9.0
150.0	75.0	6.0	13.8
250.0	100.0	9.0	27.5



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