

# TECHNICAL SPECIFICATION OF SS BARS

## **ASTM A 276**

Standard specification for stainless and heat resisting steel bars and shapes.

This specification covers hot finished or cold finished bars except bars for re-forging and hot rolled or extruded shapes, such as angles, tees and channels in the more commonly used type of stainless steel, excluding the free matching types of general corrosion resistance and high temperatures services.

### **Manufactured conditions are available as follows:**

A - Annealed

H - Hardened and tempered at a relative low temperature.

T - Hardened and tempered at a relatively high temperature.

S - Stain hardened relatively high cold work.

B - Relatively severe cold work.

## **ASTM A 314**

Standard specification for stainless and heat resisting and bars for forgings.

The specification covers stainless and heat resisting steel billets and bars intended only for forgings.

## **ASTM A 582**

Standard specification for free machining stainless and heat resisting steel bars, hot rolled or cold finished.

Typical grades are types 303, 303SE, 416 etc. This specification covers hot finished or cold finished bars, except bars for forging. It includes rounds, square and hexagons in the more commonly used types of stainless and heat resisting free machining steel designed especially for optimum machinability and for general corrosion and high temperature services.

## **ASTM A 476**

Standard specification for stainless and heat resisting steel bars and shapes for used in boilers and other pressure vessels.

The specification covers hot and cold finished bars of stainless and heat resisting steel, including rounds, squares and hexagons and hot rolled or extruded shapes such as angles, tees and channels for use in boiler and pressure vessels construction. It is also related to the ASME boiler and pressure vessel code SA-279 section II.

## **ASTM A 484**

Standard specification general requirements for stainless and heat resisting bars, billets and forgings.

This specification covers general requirements which shall apply to stainless and heat resisting wrought steel bars, shapes forgings and billets or other semi finished material (except wire) for forging. Pertinent details contained in this specification are tolerances for size, width, thickness, length and straightness of bars materials.

## Conditions and Surface Finish

Stainless and heating resisting bars are produced in various conditions and surface finished. It is important that conditions be associated with the appropriate finish because each finish is not applicable to every condition.

## ASTM Tolerance

Stainless and heating resisting bars are produced in various conditions and surface finished. It is important that conditions be associated with the appropriate finish because each finish is not applicable to every condition.

Specified Size, in (MM)	Permissible Variation from Specified Size in (MM)		Out of Round or Out of Square in (MM)
	Over	Under	
3/16 to 7/16 (8.00 to 11.00), incl	0.006 (0.15)	0.006 (0.15)	0.009 (0.23)
3/16 to 7/16 (8.00 to 11.00), incl	0.007 (0.18)	0.007 (0.18)	0.010 (0.26)
Over 5/8 to 7/8 (15.50 to 22.00), incl	0.008 (0.20)	0.008 (0.20)	0.012 (0.30)
Over 7/8 to 1 (22.00 to 25.00), incl	0.009 (0.23)	0.009 (0.23)	0.013 (0.34)
Over 1 to 1-1/8 (25.00 to 28.00), incl	0.010 (0.25)	0.010 (0.25)	0.015 (0.38)
Over 1-1/8 to 1-1/4 (28.00 to 31.50), incl	0.011 (0.28)	0.011 (0.28)	0.016 (0.42)
Over 1-1/4 to 1-3/8 (31.50 to 34.50), incl	0.012 (0.30)	0.012 (0.30)	0.018 (0.46)
Over 1-3/8 to 1-1/2 (34.50 to 38.00), incl	0.014 (0.35)	0.014 (0.35)	0.021 (0.53)
Over 1-1/2 to 2 (38.00 to 50.00), incl	1/64 (0.40)	1/64 (0.40)	0.23 (0.60)
Over 2 to 2-1/2 (50.00 to 63.00), incl	1/32 (0.80)	0	0.23 (0.60)
Over 2-1/2 to 3-1/2 (63.00 to 90.00), incl	3/64 (1.20)	0	0.035 (0.90)
Over 3-1/2 to 4-1/2 (90.00 to 115.00), incl	1/16 (1.60)	0	0.048 (1.20)
Over 4-1/2 to 5-1/2 (115.00 to 140.00), incl	5/64 (2.00)	0	0.058 (1.50)
Over 5-1/2 to 6-1/2 (140.00 to 175.00), incl	1/8 (3.00)	0	0.70 (1.80)

165.00), incl

Over 6-1/2 to 8 (165.00 to 200.00), incl      5/32 (4.00)      0      0.85 (2.20)

Over 8 to 12 (200.00 to 300.00), incl      3/18 (4.80)      0      3/32 (2.40)

Over 12 to 15 (300.00 to 400.00), incl      7/32 (5.50)      0      7/64 (2.80)

Over 15 to 25 (400.00 to 625.00), incl      1/4 (6.50)      0      1/8 (3.20)

### DIN Tolerance

Size Range	h6	h7	h8	h9	h11	h12	h13	K12/K13
Over 1MM to 3MM	+0/-0.006	+0/-0.01	+0/-0.014	+0/-0.025	+0/-0.06	+0/-0.10	-0.14	-
Over 3MM to 6 MM	+0/-0.008	+0/-0.012	+0/-0.018	+0/-0.030	+0/-0.075	-0.120	-0.180	-
Over 6MM to 10MM	+0/-0.009	+0/-0.015	+0/-0.022	+0/-0.036	+0/-0.090	-0.150	-0.220	-
Over 10MM to 18MM	+0/-0.011	+0/-0.018	+0/-0.027	+0/-0.043	+0/-0.110	-0.180	-0.270	-
Over 18MM to 30MM	+0/-0.013	+0/-0.021	+0/-0.033	+0/-0.052	+0/-0.130	-0.210	-0.330	+0.10/+0.15
Over 30MM to 50 MM	+0/-0.016	+0/-0.025	+0/-0.039	+0/-0.062	+0/-0.160	-0.250	-0.390	+0.15/+0.20
Over 50MM to 80MM	+0/-0.019	+0/-0.030	+0/-0.046	+0/-0.074	+0/-0.190	-0.300	-0.460	+0.20/+0.25
Over 80MM	+0/-0.022	+0/-0.035	+0/-0.054	+0/-0.087	+0/-0.220	-0.350	-0.540	+0.25/+0.30

to  
120MM

### Hardness Conversion Chart

Brinell Hardness HB	Vickers Hardness HV	Rockwell Hardness HRC	Rockwell Hardness HRB	Tensile Strength ksi
321	339	34	108	158
311	328	33	108	154
302	319	32	107	150
293	309	31	106	146
285	301	30	105	142
277	292	29	104	138
269	284	28	104	135
262	276	27	103	131
255	269	25	102	25
248	261	24	101	121
241	253	23	100	119
235	247	22	99	117
229	241	21	98	113
223	234	--	97	110
217	228	--	96	107
212	222	--	95	102
207	218	--	95	100
202	212	--	94	98
197	207	--	93	96
192	202	--	92	94
187	196	--	91	90
183	192	--	90	89
179	188	--	89	87
174	182	--	88	84
170	178	--	87	82

166	175	--	86	80
163	171	--	85	78
159	167	--	84	77
156	163	--	83	76
153	160	--	82	75
149	156	--	81	74
146	153	--	80	72
143	150	--	79	71
140	147	--	78	70
137	143	--	76	67
134	140	--	75	66
131	137	--	74	65
128	134	--	73	64
126	132	--	72	63
124	129	--	71	62
121	127	--	70	60
118	124	--	69	59
116	122	--	68	58
114	119	--	67	57
111	117	--	--	--