

GUIDE TO SELECTION

Hot Rolled Carbon Steel Bars

TYPES OF HOT ROLLED BAR

Merchant quality is the lowest quality for carbon steel bars. Merchant quality bars are produced to specified sizes with appropriate control of the chemical limits or mechanical properties for non-critical uses. Bars of this quality are usually rolled from unconditioned billets. These bars are used in structural and miscellaneous applications involving mild cold bending, hot forming, punching, and welding. Internal porosity, surface seams and other surface irregularities may be present in this quality bar. Merchant bar quality is designated with an M before the grade such as M1044.

Special bar quality (SBQ) is the basic or standard quality for carbon steel bars. These bars can be produced using a variety of practices dependent on end use and customer specifications. They are free of excessive chemical segregation and have minimized surface imperfections as compared to merchant quality bar. SBQ can be produced to chemical requirements and/or mechanical property requirements. SBQ are used when the application, method of fabrication, or subsequent processing treatment requires characteristics not found in merchant quality bars. Typical applications are hot forging, heat treating, cold drawing, machining, and many structural applications.

LOW CARBON

COMMERCIAL QUALITY

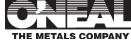
A low carbon general purpose steel that offers excellent formability and weldability. This steel is used for a wide variety of applications including banding, strapping, brackets, ornamental iron work, agricultural implements and other like applications. Our commercial quality flats are generally produced from the slit and edged process. We can slit 16 gauge through 1/4" coils to custom widths. We can edge condition 14 gauge through 3/8" coils to custom lengths up to 12" wide.

AISI 1018-SBQ

A low carbon steel that offers good formability and weldability. Since AISI 1018 has a higher manganese content than Commercial Quality and AISI 1020, it offers better carburizing (case hardening) properties. The machinability of AISI 1018 is better than Commercial Quality. The mechanical properties of AISI 1018 are higher than Commercial Quality. This grade is used in gears, pins, studs, bolts, farm implements, industrial machinery and other similar applications.

AISI 1020-SBQ

A low carbon steel that is comparable to AISI 1018. This grade offers good formability and weldability. Mechanical properties and applications are similar to AISI 1018.



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Hot Rolled Carbon Steel Bars

MEDIUM CARBON

AISI M1044

A medium carbon merchant quality steel that is similar to AISI 1045. This grade is formable and weldable using good shop practices. AISI M1044 is used in applications such as agricultural implements, industrial equipment, and construction equipment.

AISI 1045-SBQ

A medium carbon steel that offers greater strength and hardness as compared to the low carbon grades. Formability and weldability of AISI 1045 is fair when using accepted shop practices. While machinability is good, this grade responds very well to forging and heat treating. Applications include gears, shafts, axles, bolts, studs, crane wheels, and machine parts.

RESULPHURIZED LOW CARBON

AISI 1117-SBQ

A resulphurized low carbon, high manganese steel that offers good machinability and excellent case hardening. Formability is good and weldability is fair. This grade offers improved mechanical properties over AISI 1018/1020 due to the higher manganese content. AISI 1117 is used for making many types of parts requiring considerable machining and smooth surface finish. Applications include shafts, pins, gears, and other machined parts.

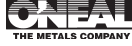
RESULPHURIZED MEDIUM CARBON

AISI 1141-SBQ

A resulphurized medium carbon, high manganese steel with good machinability and high strength. Hardness and strength may be improved further through heat treatment. AISI 1141 has fair formability and is difficult to weld. Applications include axles, bolts, shafts, and pins where good machinability and higher strength are required.

AISI 1144-SBQ

A resulphurized medium carbon, high manganese steel that is similar to AISI 1141. This grade has higher sulphur and slightly higher carbon content as compared to AISI 1141. The result is excellent machinability with higher strength. This grade may be heat treated to improve strength and hardness. AISI 1144 has only fair formability and is very difficult to weld. Applications include gears, shafts, pins, studs, and bolts needing good machinability and high strength. This grade is often used for induction hardened parts.



GUIDE TO SELECTION Hot Rolled Carbon Steel Bars

STRUCTURAL QUALITY

ASTM A-36

Intermediate tensile strength carbon steel for use in riveted, bolted, or welded construction of bridges and buildings and for general structural use. A-36 is one of the most widely used carbon steels for construction purposes. It is weldable, formable, and machinable. The minimum yield point is 36,000 psi and the tensile strength is 58,000-80,000 psi.

ASTM / A529 Grade 50

This grade is basically the same as ASTM A-36 with a modified yield point of 50,000 psi minimum and tensile strength of 70,000 - 100,000 psi. It is used in a variety of applications where additional strength is required.

HIGH STRENGTH LOW ALLOY (HSLA)

ASTM A-572 Grade 50

A HSLA columbium-vanadium steel with a higher yield and tensile strength as compared to ASTM A-36. It is used in bridges, buildings, construction equipment, freight cars, machinery, truck parts, and other applications. These stronger steels permit the reduction of section thickness and weight, providing added payload capacity in transportation applications as well as material cost savings. ASTM A-572, Grade 50 is weldable, formable, and machinable when using appropriate techniques. For Grade 50, the minimum yield point is 50,000 psi and the minimum tensile strength is 65,000 psi. ASTM A-572 is also available in grades 42, 60, and 65.

ASTM A-588 Grade A Corten B

AHSLA steel containing small additions of copper, chromium, and nickel. For use in bridges, buildings, freight cars, construction equipment, smokestack liners, precipitators, transmission towers, and light poles where savings in weight and/or added durability are important. The atmospheric corrosion resistance of this steel is a minimum of four times that of regular carbon steel. These steels are often used unpainted and develop a weathered orange-brown surface that is resistant to corrosion. ASTM A-588 Grade A is weldable, formable, and machinable when using the appropriate techniques. The minimum yield point is 50,000 psi and the minimum tensile strength is 70,000 psi. All sizes of ASTM A-588 are silicon killed. ASTM A-588 is also available in grades B, C, and K.



HOT ROLLED FLATS

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	CQ	ASTM A-36	ASTM A-36 MOD	AIS M1044
1/8 x 1/2	0.21	4.25	X			X
5/8	0.27	5.31	X			
3/4	0.32	6.37	X			
7/8	0.37	7.44	X			
1	0.42	8.50	X			
1-1/8	0.48	9.56	X			
1-1/4	0.53	10.62	X			
1-1/2	0.64	12.75	X			
1-3/4	0.74	14.87	X			
2	0.85	17.00	X			
2-1/8	0.90	18.06	X			
2-1/4	0.96	19.12	X			
2-1/2	1.06	21.25	X			
2-3/4	1.17	23.37				
3	1.27	25.50	X			
3-1/2	1.49	29.75	X			
4	1.70	34.00	X			
4-1/2	1.91	38.25	X			
5	2.12	42.50	X			
6	2.55	50.99	X			
7	2.97	59.40	X			
8	3.40	67.99	X			
10	4.25	84.99	X			
11	4.67	93.49	X			
12	5.10	101.99	X			
3/16 x 1/2	0.32	6.37	X	X		
5/8	0.40	7.96	X			
3/4	0.48	9.56	X	X		
1	0.64	12.75	X	X		
1-1/4	0.80	15.94	X			
1-3/8	0.88	14.03	X			
1-1/2	0.96	19.12	X	X		
1-3/4	1.12	22.31	X			
2	1.27	25.50	X			
2-1/4	1.43	28.68	X			
2-1/2	1.59	31.87	X			
2-3/4	1.75	35.08	X			
3	1.91	38.25	X			
3-1/4	2.07	41.43	X			

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HOT ROLLED FLATS

Size In Inches	Weight	Weight	CQ	ASTM	ASTM	AISI	AISI
	Per Foot	Per 20'		A-36	A-36 MOD	M1044	1045
	Pounds	Bar					SBQ
3/16 x 3-1/2	2.23	44.62	X				
3-5/8	2.31	46.21	X	X			
3-3/4	2.39	47.81	X				
4	2.55	50.99	X	X			
4-1/2	2.87	57.37	X				
5	3.19	63.74	X				
6	3.83	76.60	X				
7	4.46	89.24	X				
8	5.10	101.99	X				
9	5.74	114.80	X				
10	6.37	127.48	X				
11	7.01	140.23	X				
12	7.65	152.98	X				
1/4 x 1/2	0.42	8.50	X	X			
5/8	0.53	10.62		X			
3/4	0.64	12.75		X			
1	0.85	17.00	X	X			
1-1/4	1.06	21.25	X	X			X
1-1/2	1.27	25.50	X	X			X
1-3/4	1.49	29.75	X	X			
2	1.70	34.00	X	X			
2-1/4	1.91	38.25	X	X			
2-1/2	2.12	42.50	X	X			X
2-3/4	2.34	46.74	X	X			
3	2.55	50.99	X	X			
3-1/4	2.76	55.24	X				
3-1/2	2.97	59.49	X	X			
3-3/4	3.19	63.74		X			
4	3.40	67.99	X	X	X		
4-1/2	3.82	76.49	X	X	X		
5	4.25	84.99	X	X	X		
5-1/2	4.67	93.49	X	X			
5-3/4	4.89	97.74	X				
6	5.10	101.99	X	X	X		
6-1/2	5.52	110.49	X				
7	5.95	118.00	X	X	X		
8	6.80	135.98		X	X		
9	7.65	152.98	X	X			
10	8.50	169.98	X	X	X		

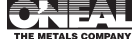
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HOT ROLLED FLATS

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	CQ	ASTM A-36	ASTM A-36 MOD	AISI M1044	AISI 1045 SBQ
1/4 x 11	9.35	186.98		X			
11-1/2	9.77	195.48	X	X			
12	10.20	203.98		X	X		
5/16 x 3/4	0.80	15.94		X			
1	1.06	21.21		X			
1-1/8	1.19	23.87		X			
1-1/4	1.33	26.52		X			
1-1/2	1.59	31.82		X			
1-3/4	1.86	37.12		X			
2	2.39	47.73		X			
2-1/4	2.39	47.73		X			
2-1/2	2.65	53.03		X			
2-3/4	2.92	58.40		X			
3	3.18	63.64		X			
3-1/4	3.45	68.94		X			
3-1/2	3.71	74.25		X			
4	4.24	84.85		X			
4-1/2	4.77	95.46		X			
5	5.30	106.07		X	X		
5-1/4	5.57	111.37		X			
6	6.36	127.28		X	X		
7	7.42	148.49		X			
8	8.49	169.71		X	X		
10	10.63	212.60		X	X		
3/8 x 5/8	0.80	15.94		X			
3/4	0.96	19.12		X			
1	1.27	25.50		X			
1-1/4	1.59	31.87		X			
1-3/8	1.75	35.06		X			
1-1/2	1.91	38.25		X			X
1-5/8	2.07	42.44		X			
1-3/4	2.23	44.62		X			
2	2.55	50.99		X			X
2-1/4	2.87	57.37	X	X			
2-1/2	3.19	63.74		X			
2-3/4	3.51	70.12	X	X			
3	3.82	76.49		X			
3-1/4	4.14	82.87		X			

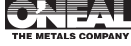
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HOT ROLLED FLATS

Size In Inches	Weight	Weight	CQ	ASTM	ASTM	AISI	AISI
	Per Foot	Per 20'		A-36	A-36 MOD	M1044	1045
	Pounds	Bar					SBQ
3/8 x 3-1/2	4.46	89.24		X			X
3-3/4	4.78	95.61		X			
4	5.10	101.99		X	X		
4-1/2	5.74	114.74		X	X		
5	6.37	127.49		X	X		
5-1/2	7.01	140.23	X	X			
6	7.65	152.98		X	X		
6-1/2	8.29	165.73		X			
7	8.92	178.48		X	X		
8	10.20	203.98		X	X		
9	11.47	229.47		X	X		
10	12.75	254.97		X	X		
11	14.02	280.47		X	X		
12	15.30	305.96		X	X		
7/16 x 3/4	1.12	22.30		X			
1	1.49	29.72		X			
1-3/8	2.05	40.90		X			
1-3/4	2.61	52.10		X			
3-1/2	5.20	104.00		X			
4-1/2	6.70	133.96		X			
1/2 x 5/8	1.06	21.26		X			
3/4	1.28	25.50		X			
7/8	1.49	29.76		X			
1	1.70	34.00		X			
1-1/8	1.91	38.25		X			
1-1/4	2.12	42.50		X			
1-3/8	2.34	46.74		X			
1-1/2	2.55	50.99		X			
1-3/4	2.97	59.49		X			
2	3.40	67.99		X	X	X	
2-1/4	3.82	76.49		X			X
2-1/2	4.25	84.99		X			X
2-3/4	4.67	93.49		X			
3	5.10	101.99		X	X		
3-1/2	5.95	118.99		X			
4	6.80	135.98		X	X		
4-1/2	7.65	152.98		X	X		
5	8.50	169.98		X	X		

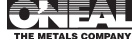
HOT ROLLED BARS



HOT ROLLED FLATS

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	CQ	ASTM A-36	ASTM A-36 MOD	AISI M1044	AISI 1045 SBQ
1/2 x 5-1/2	9.35	186.98		X			
6	10.20	203.98		X	X		
6-1/2	11.05	220.97		X			
6-3/4	11.47	229.47		X			
7	11.90	237.97		X	X		
8	13.60	271.97		X	X		
8-1/2	14.45	289.00		X			
9	15.30	305.96		X			
10	17.00	339.96		X			
11	18.70	373.96	X	X			
12	20.40	407.95		X	X		
5/8 x 3/4	1.59	31.80					
1	2.12	42.50		X			
1-1/8	2.39	47.80		X			
1-1/4	2.66	53.12		X			
1-1/2	3.19	63.74		X			
1-3/4	3.72	74.37		X			
2	4.25	84.99		X	X	X	
2-1/2	5.31	106.24		X			X
2-3/4	5.84	116.86		X			
3	6.37	127.49		X			
3-1/4	6.91	138.11		X			
3-1/2	7.44	148.73		X			
4	8.50	169.88		X	X		
4-1/4	9.03	180.62		X			
4-1/2	9.56	191.23		X	X		
5	10.63	212.60		X	X		
5-1/2	11.69	233.80		X			
6	12.75	255.00		X	X	X	
7	14.87	297.47		X			
8	17.00	340.00		X	X	X	
9	19.12	382.46		X			
10	21.25	424.95		X	X		
12	25.50	509.94		X	X		
3/4 x 1	2.55	50.99		X			
1-1/4	3.19	63.75		X			
1-1/2	3.82	76.49		X		X	
1-5/8	4.14	82.88		X			

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HOT ROLLED FLATS

Size In Inches	Weight	Weight	CQ	ASTM	ASTM	AISI	AISI
	Per Foot	Per 20'		A-36	A-36 MOD	M1044	1045
	Pounds	Bar					SBQ
3/4 x 1-3/4	4.46	89.24		X	X		
2	5.10	101.99		X	X		
2-1/4	5.74	114.74		X			
2-1/2	6.37	127.49		X		X	
3	7.65	152.98		X		X	X
3-1/2	8.92	178.48		X			
4	10.20	203.98		X	X	X	X
4-1/2	11.47	229.47		X			
5	12.75	254.97		X	X	X	
5-1/2	14.02	280.47		X			
6	15.30	305.96		X	X		
7	17.85	356.96		X	X		
8	20.40	407.95		X	X		
9	22.95	458.95		X			
10	25.50	509.94		X	X		
11	28.05	560.93		X			
12	30.60	611.93		X	X		
7/8 x 1	2.97	59.49		X			
1-1/2	4.46	89.24		X			
2	5.95	118.99		X			
2-1/4	6.69	133.80		X			
3	8.92	178.48		X			
4	11.90	237.97		X			
4-1/2	13.39	267.72		X			
5	14.87	297.47		X			
6	17.85	356.96		X			
1 x 1-1/8	3.82	76.49					
1-1/4	4.25	84.99		X			
1-1/2	5.10	101.99		X			
1-5/8	5.52	110.49		X			
1-3/4	5.95	118.99		X			
2	6.80	135.98		X			
2-1/4	7.65	152.98		X			
2-1/2	8.50	169.98		X			
2-3/4	9.35	196.98		X			
3	10.20	203.98		X			X
3-1/2	11.90	237.97	X				X

HOT ROLLED BARS 



HOT ROLLED FLATS

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	CQ	ASTM A-36	ASTM A-36 MOD	AISI M1044	AISI 1045 SBQ
1 x 4	13.60	271.97		X	X		X
4-1/2	15.30	305.96		X			
5	17.00	339.96		X	X		X
5-1/2	18.70	373.96		X			
6	20.40	407.95		X	X		
6-1/2	22.10	441.95		X			
7	23.80	474.94		X			
8	27.20	542.94		X			
9	30.60	611.93		X			
10	34.00	679.92		X	X		
12	40.80	815.90		X	X		
1-1/4 x 1-1/2	6.37	127.49		X			
2	8.50	169.98		X		X	
2-1/4	9.56	191.23		X			
2-1/2	10.62	212.48		X			
3	12.75	254.97		X			X
3-1/2	14.87	297.47		X			X
4	17.00	339.96		X		X	X
4-1/2	19.12	382.46		X			
5	21.25	424.95		X			
5-1/2	23.37	467.45		X			
6	25.50	509.94		X			
7	29.75	594.93		X			
8	34.00	679.92		X			
10	42.50	849.90					
1-1/2 x 1-3/4	8.92	178.48		X			
2	10.20	203.98		X			
2-1/4	11.47	229.47		X			
2-1/2	12.75	254.97		X			
3	15.30	305.96		X			X
3-1/2	17.85	356.96		X			
4	20.40	407.95		X			X
4-1/2	22.95	458.95		X			
5	25.50	509.94		X			
6	30.60	611.93		X			X
7	35.70	714.00		X			X
8	40.80	815.90		X			

HOT ROLLED BARS



HOT ROLLED FLATS

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	CQ	ASTM A-36	ASTM A-36 MOD	AISI M1044	AISI 1045 SBQ
1-3/4 x 2	11.90	237.97		X			
2-1/2	14.87	297.47		X			
3-1/2	20.82	416.45		X			
4	23.80	475.94		X			X
5	29.75	594.93		X			
6	35.70	713.92		X			
2 x 2-1/4	15.30	305.96		X			
2-1/2	17.00	339.96		X			
3	20.40	407.95		X			
3-1/2	23.80	475.94		X			
4	27.20	543.94		X			X
4-1/2	30.60	611.93		X			
5	34.00	679.93		X			X
6	40.80	815.90		X			X
8	54.39	1087.80		X			X
2-1/2 x 3	25.50	509.94		X			
4	34.00	679.92		X			
4-1/2	38.25	764.91		X			
5-1/2	51.42	1028.38		X			
3 x 4	40.80	815.90		X			
4-1/4	43.34	866.90		X			
4-1/2	45.89	917.89		X			
5	50.99	1019.88		X			
6	61.19	1223.86		X			

HOT ROLLED BARS



HOT ROLLED ROUNDS

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	CQ	ASTM A-36	ASTM A-36 MOD	AISI 1018 SBQ	AISI 1045 SBQ	ASTM A-572 Gr. 50
1/4	0.17	3.34	X					
5/16	0.26	5.20	X				X	
3/8	0.38	7.51	X	X				
7/16	0.51	10.22		X				
1/2	0.67	13.35		X			X	
9/16	0.84	16.90		X				
5/8	1.04	20.88		X	X			X
3/4	1.50	30.04		X	X			X
7/8	2.04	40.89		X	X		X	
1	2.67	53.40		X	X			X
1-1/8	3.38	67.59		X	X			X
1-1/4	4.17	83.44		X	X		X	X
1-3/8	5.05	100.96		X	X			
1-1/2	6.01	120.15		X	X		X	X
1-5/8	7.05	141.01		X			X	
1-3/4	8.18	163.54		X	X		X	X
1-7/8	9.39	187.74		X			X	
2	10.68	213.60		X	X	X	X	X
2-1/8	12.06	241.14		X				
2-1/4	13.52	270.34		X	X			X
2-3/8	15.06	301.21		X			X	
2-1/2	16.69	333.76		X	X		X	X
2-3/4	20.19	403.84		X	X		X	X
3	24.03	480.61		X	X	X	X	X
3-1/4	28.20	584.05		X			X	X
3-1/2	32.71	654.16		X		X		X
3-3/4	37.55	750.95		X		X		X
3-7/8	40.09	801.85						
4	42.72	854.41		X		X	X	X
4-1/8	45.43	908.65					X	

HOT ROLLED BARS



HOT ROLLED ROUNDS

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	CQ	ASTM A-36	ASTM A-36 MOD	AISI 1018 SBQ	AISI 1045 SBQ	ASTM A-572 Gr. 50
4-1/4	48.23	964.55				X	X	X
4-7/16	52.58	1051.54		X				
4-3/8	51.11	1022.13					X	
4-1/2	54.07	1081.37				X	X	X
4-3/4	60.24	1204.86				X	X	X
5	66.75	1335.02				X	X	X
5-1/2	80.77	1615.38				X	X	
5-3/4	88.28	1765.57				X		X
6	96.12	1922.43				X	X	X
6-1/4	104.30	2085.97					X	X
6-1/2	112.81	2258.19				X	X	
7	130.83	2616.64				X	X	
7-1/4	140.34	2806.89					X	
7-1/2	150.19	3003.80				X	X	
7-3/4	160.37	3207.39						
8	170.88	3417.66				X	X	
8-1/2	192.91	3858.22				X	X	
8-3/4	204.43	4088.51						
9	216.27	4325.47				X	X	
9-1/2	240.97	4819.43				X	X	
10	267.00	5340.09				X	X	
10-1/2	294.37	5887.45					X	
11-1/2	353.48						X	
12	384.50						X	
13	451.71						X	
14	523.88						X	
16	684.25						X	
18	866.01						X	
20	1069.14						X	

HOT ROLLED BARS



HOT ROLLED SQUARES

Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	ASTM A-36	AISI 1018 SBQ	AISI 1045 SBQ
5/16	0.33	6.62	X		
3/8	0.48	9.56	X		
1/2	0.85	17.00	X		
5/8	1.33	26.56	X		
3/4	1.91	38.25	X		
7/8	2.60	52.06	X		
1	3.40	67.99	X		X
1-1/8	4.30	86.05	X		
1-1/4	5.31	106.24	X		
1-1/2	7.65	152.98	X		
1-3/4	10.41	208.23	X		
2	13.60	271.97	X		
2-1/4	17.21	344.21	X		
2-1/2	21.25	424.95	X	X	
2-3/4	25.71	514.20	X		
3	30.60	611.93	X	X	
3-1/2	41.65	832.90	X	X	
3-3/4	47.81	956.20		X	
4	54.39	1087.87	X	X	X
4-1/2	68.85	1377.00		X	X
5	84.99	1699.80	X	X	X
6	122.39	2447.71	X	X	X

ROUGH TURNED FORGINGS

Finished Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	AISI 1045 SBQ	AISI 1144 SBQ
10	274.00	5480.00	X	X
10-1/2	301.00	6020.00	X	X
11-1/2	369.00	7380.00	X	X
12	384.50	7690.00	X	X
13	469.00	9380.00	X	X
14	542.00	10,840.00	X	X
15	621.00	12,420.00	X	X
16	705.00	14,100.00	X	X
18	902.00	18,040.00	X	X
20	1108.00	22,160.00	X	X
22	1322.00	26,440.00	X	X

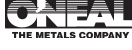
HOT ROLLED BARS



REINFORCING BARS

Number	Size In Inches	Weight Per Foot Pounds	Weight Per 20' Bar	ASTM A-615 GR40	ASTM A-615 GR 60	ASTM A-617 GR 40	ASTM A-617 GR 60
3	0.375	0.376	7.52	X	X	X	X
4	0.500	0.668	13.36	X	X	X	X
5	0.625	1.043	20.86	X	X	X	X
6	0.750	1.502	30.04	X	X	X	X
7	0.875	2.044	40.88	X	X		X
8	1.000	2.670	53.40	X	X		X
9	1.125	3.400	68.00	X			
10	1.250	4.300	86.00		X		

HOT ROLLED BARS



HOT ROLLED BARS

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