



Castle Metals®

The Oil and Gas Industry's Premier Source for
Bar & Tubing Products





Alloy Steel Bars

AISI GRADE	SIZE RANGE	CONDITION OF STEEL	AVERAGE PROPERTIES				TYPICAL HARDNESS		RELATIVE MACHINABILITY BASED ON AISI 1212 AS 100%	NACE MR01-75
			TENSILE 1000 PSI	YIELD 1000 PSI	% ELONGATION OF AREA	% REDUCTION OF AREA	BHN	ROCKWELL		
8620	1/2" - 13"	Hot Rolled M.S.	80/95	60/70	18/25	55/65	165/200	B85/93	66%	Yes
	10" - 30"	Forged & Rough Turned	80/95	60/70	18/25	55/65	165/200	B85/93	66%	Yes
8630	1/2" - 5"	Hot Rolled Normalized	90/105	65/80	18/25	35/45	175/229	B89/98	70%	No
4130	3 1/4" - 10"	Hot Rolled As Rolled, M.S.	93/135	75/110	—	—	200/280	—	75%	Yes
4130 Squares	1 1/2" - 20"	Hot Rolled or Forged & Rough Turned Normalized, Quenched & Tempered	100 Min.	75 Min.	18 Min.	35 Min.	207/235	—	75%	Yes
	12 1/2" - 26 1/2"									
4140/42	1/2" - 13"	Hot Rolled Annealed	90/100	60/70	20/30	50/60	185/210	B90/95	66%	Yes
	10" - 25"	Forged, Rough Turned Annealed	90/100	60/70	20/30	50/60	185/210	B90/95	66%	Yes
	1/2" - 13"	Hot Rolled Heat Treated	130/150	110/120	15/20	35/45	285/341	C29/36 C28/32	55%	Yes
	10" - 22"	Forged, Rough Turned Heat Treated	125/140	95/120	12/17	25/35	269/321	C27/34	55%	Yes
4140 18/22RC	3" - 11"	Hot Rolled Heat Treated	105 (min)	80 (min)	20 (min)	40 (min)	217/235	C18/22	55%	Yes
4145 "H" Mod	3" - 11"	Hot Rolled Quenched & Tempered	145	125	13	50	30/36RC	—	55%	No
			140	110	13	50	30/36RC	—	55%	No
			135	100	13	50	30/36RC	—	55%	No
4150	5/8" - 11"	Hot Rolled M.S. Annealed	90/105	65/80	15/30	35/50	185/223	B90/96	60%	No
	10" - 24"	Forged, Rough Turned, Annealed	90/105	65/75	15/30	45/55	185/215	B90/96		
	1/4" - 5"	Cold Finished Annealed	100/120	75/90	10/20	35/45	207/248	C20/25		
4150HT	1-1/2" - 11"	Hot Rolled Heat Treated	120/170	100/130	12/15	45/50	285/341	C29/36	55%	No
4340	1/2" - 13"	Hot Rolled M.S. Annealed	100/120	65/85	20/30	45/55	210/250	C16/25	57%	Yes
	10" - 22"	Forged, Rough Turned, Annealed	70/80	45/65	18/21	35/45	190/227	B92/98	57%	Yes
	1-3/8" - 11"	Hot Rolled M.S. Heat Treated	130/165	110/160	15	43	285/341	C29/36	55%	Yes
			135/145	110/120	14	42	302/365	C32/39	53%	Yes
			130/150	115/125	10	30	321/385	C34/42	50%	Yes
10" - 18"	Forged, Rough Turned Heat Treated	130/165	110/160	15	43	285/341	C29/36	55%	Yes	
4330 V Mod	2" - 9"	Hot Rolled Quenched & Tempered	160	150	15	50	335/375	BHN	50%	No

Plus a wide variety of sizes and shapes available in **Aircraft Quality** and **Premium Aircraft Quality** grades. Call Castle first for alloys.

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Stainless Steel Bars

GRADE	SIZE ⁽¹⁾ RANGE	CONDITION	Typical Mechanical Properties				Hardness		ASTM	ASME	FEDERAL	AMS	CASTLE	NACE MR01-75
			TENSILE 1000 PSI	YIELD 1000 PSI	% ELONGATION IN 2"	% REDUCTION OF AREA	BHN	ROCKWELL						
303 (UNS S30300)	1/16" - 10"	Solution Annealed	90	35	50	55	160	—	A-555, A-581 A-484, A-582	—	764	5640	—	No
304 (UNS S30400)	1/8" - 20"	Solution Annealed	85	35	60	70	170	—	A-182, A-555, A-580, A-276, A-479	SA-182 SA-479	—	5939	—	No
304-L (UNS S30403)	3/16" - 20"	Solution Annealed	75	30	60	70	160	—	A-555, A-580, A-182, A-276, A-479	SA-182 SA-479	—	5647	—	No
316 (UNS S31600)	1/8" - 20"	Solution Annealed	80	35	55	65	170	—	A-555, A-580, A-182, A-276, A-479	SA-182 SA-479	763	5648	—	No
316-L (UNS S31603)	3/16" - 20"	Solution Annealed	75	30	55	65	160	—	A-555, A-580, A-182, A-276, A-479	SA-182 SA-479	763	5653	—	No
2205 (UNS S31803)	1" - 10"	Solution Annealed	90	65	25	—	290	—	A-182 A-276	SA-182	—	—	—	—
17Cr-4Ni (UNS S17400)	1/4" - 20"	Solution Annealed	160	145	15	—	332	—	A-564	SA-564	—	2303 5643	—	No
17Cr-4Ni Double-Aged H1150 (UNS S17400)	1/2" - 9"	Heat Treated Double H-1150	130 (min)	105 (min)	16 (min)	50 (min)	—	24-33	A-564*	SA-564*	—	5643*	AMC S17 400-07	Yes
410 (UNS S41000)	1/2" - 6"	Annealed	75	40	35	70	155	—	A-555, A-580, A-276, A479	SA-479	763	2303 5612 5613	—	No
410 Quench Dbl. Tempered (UNS S41000)	2" - 15"	Quench & Dbl. Tempered	95 (min)	75 (min)	18 (min)	35 (min)	241 (max)	22 (max)	A-484, A-276, A-370, E-23 E-18	—	—	—	API 6A	Yes
XM-19 (UNS S20910)	3/4" - 6"	Solution Annealed	100,000	55,000	35	55	—	—	A-193 ⁽²⁾ A-276 A-479	—	—	5764	—	Yes RC35 (max.)
XM-19 Hi Strength (UNS S20910)	1-1/4" - 2"	H.S.	135,000	105,000	20	50	260	—	A-193 ⁽²⁾ A-276 A-479	—	—	5764*	—	Yes RC35 (max.)
XM-19 Hi Strength (UNS S20910)	1-1/4" - 4"	Solution Annealed	101,000	60,000	60	76	—	B100	A-193 ⁽²⁾ A-276 A-479	—	—	5848	—	No

⁽¹⁾Check for availability of hexes, squares, and flats

⁽²⁾Chemistry only

Nickel Alloy Bars*

ALLOY	SIZE RANGE	CONDITION ⁽²⁾	MECHANICAL PROPERTIES ⁽³⁾					SPECIFICATIONS ⁽⁶⁾			NACE MR01-75
			Density lb/in ³	Nominal Room-Temperature Mechanical Properties (Annealed material unless otherwise noted)				ASTM(B) ASME(SB)	SAE AMS	UNS	
				Tensile Strength ksi	0.2% Yield Strength ksi	Elongation %	Hardness Brinell				
Nickel 200 ⁽¹⁾	1/4" - 3"	As Rolled or Annealed	0.321	65	30	45	110	160 161 162		N02200	No
400	1/2" - 10"	As Rolled or Annealed	0.318	80	40	45	140	127 164 165	4544 4675	N04400	No
R-405	1/4" - 4"	As Rolled or Annealed	0.318	95 ⁽⁴⁾	85 ⁽⁴⁾	25 ⁽⁴⁾	205 ⁽⁴⁾	164	4674	N04405	No
K-500	1/4" - 6"	Annealed or Age Hardened	0.305	155 ⁽⁵⁾	100 ⁽⁵⁾	25 ⁽⁵⁾	310 ⁽⁵⁾	586	4676	N05500	Yes
600	1/4" - 6"	Annealed	0.306	100	50	40	170	166 168 564	5540 5665	N06600	No
625	1/4" - 8"	Annealed	0.305	125	65	50	200	443 446	5599 5666 5879	N06625	Yes
C-276	1/2" - 8"	Annealed	0.321	110	50	60	180	574 575		N10276	No
718	1/2" - 12"	Annealed (AMS) Age Hardened (NACE)	0.296	205 ⁽⁵⁾	165 ⁽⁵⁾	20 ⁽⁵⁾	425 ⁽⁵⁾	637 670	5662 ⁽⁷⁾	N07718	Yes ⁽⁷⁾
725	1" - 5"	Solution Treated Age Hardened	0.300	185 ⁽⁵⁾	130 ⁽⁵⁾	30 ⁽⁵⁾	355 ⁽⁵⁾	805		N07725	Yes
HX	1/2" - 7"	Solution Treated	0.297	110	50	50	170	435 572	5536 5254	N06002	No
800H	1/2" - 6"	Annealed	0.287	80	35	45	145	408 409 564		N08811	No
20	1/4" - 8"	Annealed	0.292	95	60	35	180	463 472 473		N08020	No
825	1" - 4"	Annealed	0.294	95	45	45	155	424 425		N08825	No
925	1/2" - 12"	Age Hardened	0.292	170 ⁽⁵⁾	120 ⁽⁵⁾	25 ⁽⁵⁾	320 ⁽⁵⁾			N09925	Yes

*All grades are also available as trepanned or gun drilled bar, many grades are available as tubulars.

- (1) Nickel 201, low carbon version suggested for temperatures above 600° F.
 (2) Available Cold Drawn or Hot Finished.
 (3) Typical data, not suited for design or specifications.
 (4) Stress-relieved.
 (5) Age-hardened.
 (6) Inventory may not meet all typical specifications.
 Check with stocking district for inventory specifications.
 (7) Available in AMS 5662 or NACE

Alloy Steel Tube

AISI GRADE	OD SIZE RANGE	CONDITION OF STEEL	AVERAGE PROPERTIES				TYPICAL HARDNESS ROCKWELL
			TENSILE 1000 PSI	YIELD 1000 PSI	% REDUCTION OF AREA	SPECS	
4140/4142	2" - 20"	Hot Rolled Annealed	80	60	25%	A519	B-85
4140/4142	2" - 20"	L80 Quenched & Tempered	95 Min.	80 Min.-95 Max	16%	A519/API5CT	C23 Max.
4140/4142	2" - 20"	P110 Quenched & Tempered	125 Min.	110 Min.-140 Max	13%	A519/API5CT	C30/36
8620	2" - 20"	Hot Rolled Annealed	80	60	18%	A519	B85
52100 B.Q.	2" - 12"	Spheroidize Annealed	100	81	25%	A295 A485	—

Carbon Steel Tube

GRADE	OD SIZE RANGE	CONDITION OF STEEL	AVERAGE PROPERTIES			SPECS	TYPICAL HARDNESS ROCKWELL
			TENSILE 1000 PSI	YIELD 1000 PSI	% ELONGATION OF AREA		
1026	3" - 24"	Hot Finished Seamless	55 Typ.	35 Typ.	25% Typ.	A-519 A-106	B60 Typ.
1026	3/8" - 16"	Cold Drawn Seamless Stress Relief Annealed	70 Typ.	55 Typ.	8% Typ.	A-519 A-106	B80 Typ.
1020	3/8" - 4"	DOM Stress Relief Annealed	65 Min.	55 Min.	10% Min.	A-513 Type 5	B75 Min.
1026	2" - 12"	DOM Stress Relief Annealed	75 Min.	65 Min.	10% Min.	A-513 Type 5	B80 Min.
ST 52.3	2" - 12"	DOM Stress Relief Annealed	85 Typ.	75 Typ.	15% Typ.	A-513 Type 5	B85 Typ.
1010	1/2" - 20"	Electric Resistance As-Welded	45 Typ.	32 Typ.	15% Typ.	A-513 Type 1	B55 Typ.

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* ULTRA-TUFF™ is a registered trademark of A. M. Castle & Co.

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Stainless Steel Tube and Pipe

GRADE	OD SIZE RANGE	CONDITION	Typical Mechanical Properties (see specification for details)				Hardness	ASTM
			TENSILE 1000 PSI	YIELD 1000 PSI	% ELONGATION IN 2"	% REDUCTION OF AREA	ROCKWELL	
304 (UNS S30400)	1/8" - 96"	Annealed	75	30	35	—	B80	A-249, A-312, A-269, A-511
304-L (UNS S30403)	1/8" - 96"	Annealed	70	25	35	—	B80	A-249, A-312, A-269, A-511
316 (UNS S31600)	1/8" - 96"	Annealed	75	30	35	—	B90	A-249, A-312, A-269, A-511
316-L (UNS S31603)	1/8" - 96"	Annealed	70	25	35	—	B90	A-249, A-312, A-269, A-511
321 (UNS 32100)	1/8" - 96"	Annealed	75	30	35	—	B90	A-249, A-269 A-312, A511
Duplex 2205 (UNS 2205/ UNS31803)	1/2" - 96"	Annealed	90	65	25	—	C31	A-789 A-790
¹AL 6XN[®] (UNS N08367)	1/2" - 4"	Annealed	112	53	50	—	B90	A-249, A269 A-312

Other Specialty grades of Stainless Steel and Duplex alloys are available through our mill sources.

¹AL 6XN is a reg TM of Alleghany Ludlum.



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