

ASTM	IRON			CHEMICAL COMPOSITION															MECHANICAL PROPERTIES				
	ASTM Code	Grade	Condition	Carbon C% Max.	Silicon Si% Max.	Manganese Mn% Max.	Nickel Ni%	Chromium Cr%	Molybdenum Mo%	Phosphorus P% Max.	Sulfur S% Max.	Copper	Cu%	Vanadium V%	Magnesium Mg%	Niobium (Columbium) Nb%	Iron Fe%	Alloy % Total - Without Iron	Charpy "V" Notch ft. lb.	Tensile Strength K.S.I.	Yield Strength K.S.I.	Elong%	Brinell Hardness #
Gray Irons	A48	Class 20	As cast	3.50 to 3.60	2.50 to 2.60	0.30 to 0.50	0.00 to 0.50	0.00 to 0.10	0.00 to 0.10	0.02 to 0.03	0.06 to 0.12	0.00 to 0.50	0.00 to 0.05				92.76	7.24		20			143-187
	A48	Class 25	As cast	3.40 to 3.50	2.40 to 2.50	0.30 to 0.70	0.00 to 0.50	0.00 to 0.10	0.00 to 0.10	0.02 to 0.03	0.06 to 0.12	0.00 to 0.50	0.00 to 0.05				92.86	7.14		25			159-223
	A48	Class 30	As cast	3.30 to 3.40	2.30 to 2.40	0.60 to 0.80	0.00 to 0.50	0.00 to 0.15	0.00 to 0.20	0.02 to 0.25	0.06 to 0.12	0.00 to 0.50	0.00 to 0.05				92.68	7.33		30			179-229
	A48	Class 35	As cast	3.15 to 3.25	2.10 to 2.25	0.70 to 0.90	0.00 to 0.75	0.00 to 0.15	0.00 to 0.30	0.02 to 0.20	0.06 to 0.12	0.00 to 0.75	0.00 to 0.10				92.60	7.40		35			187-241
	A48	Class 40	As cast	3.05 to 3.15	1.80 to 1.95	0.70 to 0.90	0.00 to 1.00	0.00 to 0.15	0.00 to 0.30	0.02 to 0.10	0.06 to 0.12	0.00 to 1.00	0.00 to 0.10				92.80	7.20		40			197-255
	A48	Class 45	As cast	2.95 to 3.05	1.70 to 1.85	0.80 to 1.00	0.00 to 1.00	0.00 to 0.20	0.00 to 0.30	0.02 to 0.10	0.06 to 0.10	0.00 to 1.00	0.00 to 0.10				92.89	7.12		45			207-269
Abrasion Resistant High Alloy Irons	A48	Class 50	As cast	2.90 to 3.00	1.65 to 1.80	0.80 to 1.00	0.00 to 1.00	0.00 to 0.20	0.00 to 0.50	0.02 to 0.08	0.06 to 0.10	0.00 to 1.00	0.00 to 0.10				92.90	7.11		50			217-269
	A532	CLII-A (NiHard-1)	As Cast	2.80 to 3.60	0.80	2.00	3.30 to 5.00	1.40 to 4.00	1.00	0.30	0.15						85.70	14.30					530-550
	A532	CLII-A (NiHard-1)	SR Harden	2.80 to 3.60	0.80	2.00	3.30 to 5.00	1.40 to 4.00	1.00	0.30	0.15						85.70	14.30					600 Min
	A532	CLII-B (NiHard-2)	As Cast	2.40 to 3.00	0.80	2.00	3.30 to 5.00	1.40 to 4.00	1.00	0.30	0.15						86.20	13.80					530-550
	A532	CLII-B (NiHard-2)	SR Harden	2.40 to 3.00	0.80	2.00	3.30 to 5.00	1.40 to 4.00	1.00	0.30	0.15						86.20	13.80					600 Min
	A532	CLII-C (NiHard-3)	As Cast	2.50 to 3.70	0.80	2.00	4.00 to 4.00	1.00 to 2.50	1.00	0.30	0.15						86.90	13.10					530-550
	A532	CLII-C (NiHard-3)	SR Harden	2.50 to 3.70	0.80	2.00	4.00 to 4.00	1.00 to 2.50	1.00	0.30	0.15						86.90	13.10					600 Min
	A532	CLII-D (NiHard-4)	As Cast	2.50 to 3.60	2.00	2.00	4.50 to 7.00	7.00 to 11.00	1.50	0.10	0.15						76.45	23.55					480-510
	A532	CLII-D (NiHard-4)	SR Harden	2.50 to 3.60	2.00	2.00	4.50 to 7.00	7.00 to 11.00	1.50	0.10	0.15						76.45	23.55					600 Min
	A532	CLII-B (15% Chrome)	Anneal	2.00 to 3.30	1.50	2.00	2.50 Max.	14.00 to 18.00	3.00	0.10	0.06	1.20					70.99	29.01					400 Max
	A532	CLII-B (15% Chrome)	Harden	2.00 to 3.30	1.50	2.00	2.50 Max.	14.00 to 18.00	3.00	0.10	0.06	1.20					70.99	29.01					600 Min
	A532	CLII-D (20% Chrome)	Anneal	2.00 to 3.30	1.00 to 2.20	2.00	2.50 Max.	18.00 to 23.00	3.00	0.10	0.06	1.20					66.39	33.61					400 Max
	A532	CLII-D (20% Chrome)	Harden	2.00 to 3.30	1.00 to 2.20	2.00	2.50 Max.	18.00 to 23.00	3.00	0.10	0.06	1.20					66.39	33.61					600 Min
	A532	CLIII-A (25% Chrome)	Anneal	2.00 to 3.30	1.50	2.00	2.50	23.00 to 30.00	3.00	0.10	0.06	1.20					61.74	38.26					400 Max
	A532	CLIII-A (25% Chrome)	Harden	2.00 to 3.30	1.50	2.00	2.50	23.00 to 30.00	3.00	0.10	0.06	1.20					61.74	38.26					600 Min
Austenitic High Alloy Ductile Iron	A439	NIRESIST-D2		3.00	1.50 to 3.00	0.70 to 1.25	18.00 to 22.00	1.75 to 2.75		0.08							71.45	28.56		58	30	8	139-202
	A439	NIRESIST-D2B		3.00	1.50 to 3.00	0.70 to 1.25	18.00 to 22.00	2.75 to 4.00		0.08							70.32	29.68		58	30	7	148-211
	A571	NIRESIST-D2W		3.00	3.00	1.50	18.00 to 22.00	1.75 to 2.25							0.10		70.40	29.60		58	30	8	140-210

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SYMBOLS	Al	Aluminum	Fe	Iron	S	Sulfur	Zn	Zinc
	As	Arsenic	Mg	Magnesium	Sb	Antimony		
	B	Boron	Mn	Manganese	Se	Selenium		
	C	Carbon	Mo	Molybdenum	Si	Silicon		
	Cb	Columbium (Niobium)	N	Nitrogen	Sn	Tin		
	Ce	Cerium	Nb	Niobium (now Columbium)	Ta	Tantalum		
	Co	Cobalt	Ni	Nickel	Ti	Titanium		
	Cr	Chromium	P	Phosphorus	V	Vanadium		
Cu	Copper	Pb	Lead	W	Tungsten			