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Cast Iron Material Comparison Chart

Specification		Grade or Class	Chemical Composition, max (unless range is given), %										Hardness max, HB	Tensile Properties, min (unless range is given)			Charpy Unnotched min, avg of highest 3	
			C	Si	Mn	S	P	Ni	Cr	Mo	Cu			Tensile Strength min, Ksi	Yield Strength Ksi @ 0.2%	Elongation in 2 in, %		
ASTM A159	Gray Iron	G1800	3.40-3.70	2.3-2.8	0.5-0.8	0.150	0.250							187	18			
		G2500	3.20-3.50	2.0-2.4	0.6-0.9	0.150	0.200							170-229	25			
		G3000	3.10-3.40	1.9-2.3	0.6-0.9	0.150	0.150							187-241	30			
		G3500	3.00-3.30	1.8-2.2	0.6-0.9	0.150	0.120							207-255	35			
		G4000	3.00-3.30	1.8-2.1	0.7-1.0	0.150	0.100							217-269	40			
ASTM A47	Malleable Iron	32510												50	32.5	10		
ASTM A48	Gray Iron	20													20			
		25													25			
		30													30			
		35													35			
		40													40			
		45													45			
		50													50			
		55													55			
ASTM A439	Austenitic Ductile Iron	D-2	3.00	1.50-3.00	0.70-1.25		0.080	18.0-22.0	1.75-2.75					139-202	58	30	8	
		D-2B	3.00	1.50-3.00	0.70-1.25		0.080	18.0-22.0	2.75-4.00					148-211	58	30	7	
		D-2C	2.90	1.00-3.00	1.80-2.40		0.080	21.0-24.0	0.5					121-171	58	28	20	
		D-3	2.60	1.00-2.80	1.00		0.080	28.0-32.0	2.50-3.50					139-202	55	30	6	
		D-3A	2.60	1.00-2.80	1.00		0.080	28.0-32.0	1.00-1.50					131-193	55	30	10	
		D-4	2.60	5.00-6.00	1.00		0.080	28.0-32.0	4.50-5.50					202-273	60			
		D-5	2.40	1.00-2.80	1.00		0.080	34.0-36.0	0.1					131-185	55	30	20	
		D-5B	2.40	1.00-2.80	1.00		0.080	34.0-36.0	2.00-3.00					139-193	55	30	6	
		D-5S	2.30	4.90-5.50	1.00		0.080	34.0-37.0	1.75-2.25					131-193	65	30	10	
ASTM A532	Abrasion Resistant Iron	I-A	2.80-3.60	0.80	2.00	0.150	0.300	3.3-5.0	1.4-4.0	1.0				550 min				
		I-B	2.40-3.00	0.80	2.00	0.150	0.300	3.3-5.0	1.4-4.0	1.0				550 min				
		I-C	2.50-3.70	0.80	2.00	0.150	0.300	4.0	1.0-2.5	1.0				550 min				
		I-D	2.50-3.60	2.00	2.00	0.150	0.100	4.5-7.0	7.0-11.0	1.5				500 min				
		II-A	2.00-3.30	1.50	2.00	0.060	0.100	2.5	11.0-14.0	3.0	1.2			550 min				
		II-B	2.00-3.30	1.50	2.00	0.060	0.100	2.5	14.0-18.0	3.0	1.2			450 min				
		II-D	2.00-3.30	1.00-2.20	2.00	0.060	0.100	2.5	18.0-23.0	3.0	1.2			450 min				
		III-A	2.00-3.30	1.50	2.00	0.060	0.100	2.5	23.0-30.0	3.0	1.2			450 min				
ASTM A536	Ductile Iron	60-40-18												60	40	18		
		65-45-12												65	45	12		
		80-55-06												80	55	6		
		100-70-03												100	70	3		
		120-90-02												120	90	2		
ASTM A897	Austempered Ductile Iron	110-70-11												110	70	11	80	
		130-90-09												130	90	9	75	
		150-110-07												150	110	7	60	
		175-125-04												175	125	4	45	
		200-155-02												200	155	2	25	
230-185-01												230	185	1	15			