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Common Forged Material Comparison Chart

			Chemical Composition, max (unless range is given), %													Tensile Properties, min (unless range is given)					Energy Value, ft.lbf		
Specification		Grade or Class	C	Si	Mn	S	P	Cu	Ni	Cr	Mo	V	Cb/Nb	N	Hardness HB, max	Tensile Strength min, Ksi	Yield Point Ksi	Yield Strength Ksi @ 0.2%	Elongation in 2 in, %	Reduction of Area, %	CVN min avg of 3 specimens	CVN min for single specimen	Testing Temp., F
AISI		1020	0.17-0.23		0.30-0.60	0.050	0.040																
AISI		1025	0.22-0.28		0.30-0.60	0.050	0.040																
AISI		1030	0.27-0.34		0.60-0.90	0.050	0.040																
AISI		1040	0.37-0.44		0.60-0.90	0.050	0.040																
AISI		1045	0.42-0.50		0.60-0.90	0.050	0.040																
AISI		4130	0.28-0.33	0.15-0.30	0.40-0.60	0.040	0.035			0.80-1.10	0.15-0.25												
AISI		4140	0.38-0.43	0.15-0.30	0.75-1.00	0.040	0.035			0.80-1.10	0.15-0.25												
AISI		4330	0.28-0.33	0.15-0.30	0.60-0.80	0.040	0.035		1.65-2.00	0.70-0.90	0.20-0.30												
AISI		4340	0.37-0.43	0.15-0.30	0.60-0.80	0.040	0.035		1.65-2.00	0.70-0.90	0.20-0.30												
AISI		8620	0.18-0.23	0.15-0.30	0.70-0.90	0.040	0.035		0.40-0.70	0.40-0.60	0.15-0.25												
AISI		8625	0.23-0.28	0.15-0.30	0.70-0.90	0.040	0.035		0.40-0.70	0.40-0.60	0.15-0.25												
AISI		8630	0.28-0.33	0.15-0.30	0.65-0.95	0.040	0.035		0.35-0.75	0.40-0.60	0.15-0.25												
ASTM A105	Carbon Steel, Piping		0.35	0.10-0.35	0.60-1.05	0.040	0.035	0.40	0.40	0.30	0.12	0.08			187	70		36	22	30			
ASTM A181	Carbon Steel, General	60	0.35	0.10-0.35	1.10	0.050	0.050									60		30	22	35			
		70	0.35	0.10-0.35	1.10	0.050	0.050									70		36	18	24			
ASTM A266	Carbon Steel, Pressure Vessel Components	1	0.30	0.15-0.35	0.40-1.05	0.025	0.025									60-85		30	23	38			
		2	0.30	0.15-0.35	0.40-1.05	0.025	0.025									70-95		36	20	33			
		3	0.35	0.15-0.35	0.80-1.35	0.025	0.025									70-95		36	20	33			
		4	0.30	0.15-0.35	0.80-1.35	0.025	0.025									75-100		37.5	19	30			
ASTM A350	Carbon and Low Alloy Steel, Piping Components	LF1	0.30	0.15-0.30	0.60-1.35	0.040	0.035	0.40	0.40	0.30	0.12	0.08	0.02			60-85		30	25	38	13	10	-20
		LF2-1	0.30	0.15-0.30	0.60-1.35	0.040	0.035	0.40	0.40	0.30	0.12	0.08	0.02			70-95		36	22	30	15	12	-50
		LF2-2	0.30	0.15-0.30	0.60-1.35	0.040	0.035	0.40	0.40	0.30	0.12	0.08	0.02			70-95		36	22	30	20	15	0
		LF3-1	0.20	0.20-0.35	0.90	0.040	0.035	0.40	3.30-3.70	0.30	0.12	0.03	0.02			70-95		37.5	22	35	15	12	-150
		LF3-2	0.20	0.20-0.35	0.90	0.040	0.035	0.40	3.30-3.70	0.30	0.12	0.03	0.02			70-95		37.5	22	35	20	15	-150
		LF5-1	0.30	0.20-0.35	0.60-1.35	0.040	0.035	0.40	1.00-2.00	0.30	0.12	0.03	0.02			60-85		30	25	38	15	12	-75
		LF5-2	0.30	0.20-0.35	0.60-1.35	0.040	0.035	0.40	1.00-2.00	0.30	0.12	0.03	0.02			70-95		37.5	22	35	15	12	-75
		LF6-1	0.22	0.15-0.30	1.15-1.50	0.025	0.025	0.40	0.40	0.30	0.12	0.04-0.11	0.02	0.01-0.03		66-91		52	22	40	15	12	-60
		LF6-2	0.22	0.15-0.30	1.15-1.50	0.025	0.025	0.40	0.40	0.30	0.12	0.04-0.11	0.02	0.01-0.03		75-100		60	20	40	20	15	-60
		LF6-3	0.22	0.15-0.30	1.15-1.50	0.025	0.025	0.40	0.40	0.30	0.12	0.04-0.11	0.02	0.01-0.03		75-100		60	20	40	20	15	0
		LF9	0.20		0.40-1.06	0.040	0.035	0.75-1.25	1.60-2.24	0.30	0.12	0.03	0.02			63-88		46	25	38	13	10	-20
		LF787-2	0.07	0.40	0.40-0.70	0.025	0.025	1.00-1.30	0.70-1.00	0.60-0.90	0.15-0.25	0.03	0.02 min			65-85		55	20	45	15	12	-75
		LF787-3	0.07	0.40	0.40-0.70	0.025	0.025	1.00-1.30	0.70-1.00	0.60-0.90	0.15-0.25	0.03	0.02 min			75-95		65	20	45	15	12	-100
ASTM A521	Closed Die Forging, General use	AA														80		50	24	40			
		AB														80		55	26	52			
		AC														96		70	20	50			
		AD														90		65	20	50			
		AE														105		80	20	50			
		AF														125		105	16	50			
		AG														145		120	15	45			
		AH														170		140	13	40			
		CA																					
		CC														60		30	25	36			
		CC1														66		33	23	36			
		CE														75		37	24	40			
		CF														80		40	22	36			
		CF1														85		44	25	40			
		CG														90		55	20	39			
ASTM A668	Carbon Steel Forging	A (AH)			1.35	0.050	0.050								183	47							
		B (BH)			1.35	0.050	0.050								120-174	60	30	30	24	36			
		C (CH)			1.35	0.050	0.050								137-183	66	33	33	22	34			
		D (DH)			1.35	0.050	0.050								149-207	75	37	37	19	30			
		E (EH)			1.35	0.050	0.050								174-217	83	43	43	22	35			
		F (FH)			1.35	0.050	0.050								174-217	82	48	48	19	36			
	Alloy Steel Forging	G (GH)				0.040	0.040								163-207	80	50	50	22	38			
		H (HH)				0.040	0.040								187-235	90	58	58	18	40			
		J (JH)				0.040	0.040								207-255	90	65	65	18	48			
		K (KH)				0.040	0.040								207-269	100	75	75	18	48			
		L (LH)				0.040	0.040								223-293	110	85	85	14	40			
		M (MH)				0.040	0.040								269-341	135	110	110	12	38			
		N (NH)				0.040	0.040								321-402	160	130	130	11	35			