

Steel grades according to American standards - A36, A572, A588, A709, A913, A992

Mechanical properties

Standards	Grades	Yield strength Re	Tensile strength Rm	Ratio Re / Rm	Minimum elongation		Notch impact test	
					min. 200 mm [8 in.]	min. 50 mm [2 in.]	ASTM A673, standard position longitudinal flange	
		MPa [ksi]	MPa [ksi]		%		Temperature °C (°F)	Energy average J [ft-lbf]
A36 - 04b	A36	≥250 [36]	400-550 [58-80]		20	21		
A572 - 04	Grade 42	≥290 [42]	≥415 [60]		20	24		
	Grade 50	≥345 [50]	≥450 [65]		18	21		
	Grade 55	≥380 [55]	≥485 [70]		17	20		
	Grade 60	≥415 [60]	≥520 [75]		16	18		
	Grade 65	≥450 [65]	≥550 [80]		15	17		
A588 - 04	Grade B	≥345 [50]	≥485 [70]		18	21		
	Grade C	≥345 [50]	≥485 [70]		18	21		
A709 - 04a	Grade 36	≥250 [36]	400-550 [58-80]		20	21		
	Grade 50	≥345 [50]	≥450 [65]		18	21		
	Grade 50S	345-450 [50-65]	≥450 [65]	≤0.85	18	21		
A913 - 04	Grade 50	≥345 [50]	≥450 [65]	≤0.85	18	21	21 [70]	≥54 [40]
	Grade 65	≥450 [65]	≥550 [80]		15	17	21 [70]	≥54 [40]
A992 - 04a	A992	345-450 [50-65]	≥450 [65]	≤0.85	18	21		

Chemical composition

Standards	Grades	Ladle analysis												
		C max. %	Mn %	S max. %	P max. %	Si %	Cu %	Ni %	Cr %	Mo max. %	Nb max. %	V %	CEmax. %	Other elements
A36 - 04b	A36	0.26		0.05	0.04	≤0.40								
A572 - 04	Grade 42	0.21	≤1.35	0.05	0.04	≤0.40								
	Grade 50	0.23	≤1.35	0.05	0.04	≤0.40								
	Grade 55	0.25	≤1.35	0.05	0.04	≤0.40								
	Grade 60	0.26	≤1.35	0.05	0.04	≤0.40								
	Grade 65	0.23	≤1.65	0.05	0.04	≤0.40								
A588 - 04	Grade B	0.20	0.75-1.3	0.05	0.04	0.15-0.50	0.20-0.40	≤0.5	0.40-0.70			0.01-0.10		
	Grade C	0.15	0.80-1.35	0.05	0.04	0.15-0.40	0.20-0.50	0.25-0.50	0.30-0.50			0.01-0.10		
A709 - 04a	Grade 36	0.26		0.05	0.04	≤0.40								
	Grade 50	0.23	≤1.35	0.05	0.04	≤0.40								
	Grade 50S	0.23	0.50-1.50	0.045	0.035	≤0.40	≤0.60	≤0.45	≤0.35	0.15	0.05	≤0.11	0.45	
A913 - 04	Grade 50	0.12	≤1.60	0.030	0.040	≤0.40	≤0.45	≤0.25	≤0.25	0.07	0.05	≤0.06	0.38	
	Grade 65	0.16	≤1.60	0.030	0.030	≤0.40	≤0.35	≤0.25	≤0.25	0.07	0.05	≤0.06	0.43	
A992 - 04a	A992	0.23	0.50-1.50	0.045	0.035	≤0.40	≤0.60	≤0.45	≤0.35	0.15	0.05	≤0.15	0.45	