Alloy Steel Stainless Mechanical Properties

GB	ASTM	JIS	EN	Mechanical properties
20Mn2	1524	SMn420	—	Tensile strength ≥785MPa Yield limit≥590MPa Elongation ≥10% Reduction of area ≥40% Impact absorption power ≥47Aku2/J Hardness: not heat-treated ≤187HB
50Mn2	—	—	—	The first quenching heating temperature (℃): 820; coolant: oil The second quenching heating temperature (℃):- Tempering heating temperature (℃): 550; Coolant: water, oil Tensile strength (σb/MPa): ≥930 Yield point (σs/MPa): ≥785 Elongation after breaking (δ5/%): ≥9 Reduction of area (ψ/%): ≥40 Impact absorption (Aku2/J): ≥39 Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≤ 229
27SiMn	—	—	—	Tensile strength (σb/MPa): ≧980 Yield point (σs/MPa): ≧835 Elongation after breaking (δ5/%): ≧12 Reduction of area (ψ/%): ≧40 Impact absorption (Aku2/J): ≧39 Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≦ 217

35SiMn	—	—	—	The first quenching heating temperature (°C): 900; coolant: water The second quenching heating temperature (°C): Tempering heating temperature (°C): 570; Coolant: water, oil Tensile strength σb (MPa): ≥885(90) Yield strength σs (MPa): ≥735(75) Elongation δ5 (%): ≥15 Reduction of area ψ (%): ≥45 Impact energy Akv (J): ≥47 Impact toughness value αkv (J/cm2): ≥59(6) Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≤ 229
20Cr	5120	SCr420	17Cr3(1.7016)	The first quenching heating temperature (°C): 880; coolant: water, oil The second quenching heating temperature (°C): 780～820; coolant: water, oil Tempering heating temperature (°C): 200; Coolant: water, air Tensile strength (σb/MPa): ≥835 Yield point (σs/MPa): ≥540 Elongation after breaking (δ5/%): ≥10 Reduction of area (ψ/%): ≥40 Impact absorption (Aku2/J): ≥47 Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≤ 179

40Cr	5140	SCr440	41Cr4(1.7035)	The first quenching heating temperature (℃): 850; coolant: oil The second quenching heating temperature (℃):- Tempering heating temperature (℃): 520; Tensile strength (σb/MPa): ≥810 (when actual hardness is 25HRC) Yield point (σs/MPa): ≥785 Elongation after breaking (δ5/%): ≥9 Reduction of area (ψ/%): ≥45 Impact absorption (Aku2/J): ≥47 Brinell hardness (100/3000HBW) (annealed or high temperature tempered state): ≤ 207
38CrSi	—	—	—	The first quenching heating temperature (℃): 900; coolant: oil The second quenching heating temperature (℃):- Tempering heating temperature (℃): 600; Coolant: water, oil Tensile strength σb (MPa): ≥960(100) Yield strength σs (MPa): ≥840(85) Elongation δ5 (%): ≥12 Reduction of area ψ (%): ≥50 Impact energy Akv (J): ≥55 Impact toughness value αkv (J/cm2): ≥69(7) Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≦ 255

12CrMo	—	—	—	Tensile strength σb (MPa): ≥410(42) Yield strength σs (MPa): ≥265(27) Elongation δ5 (%): ≥24 Reduction of area ψ (%): ≥60 Impact energy Akv (J): ≥110 Impact toughness value αkv (J/cm²): ≥137(14) Hardness: ≤179HB
15CrMo	—	SCM415	18CrMo4(1.7243)	Tensile strength MPa: 440~640 Yield point MPa: 295 Elongation (%): 22
20CrMo	4118	SCM420	18CrMo4(1.7243)	Tensile strength ob (MPa): >885(90) Yield strength os (MPa): >685(70) Elongation 85 (%): >12 Reduction of area (%): >50 Impact energy Akv(J): >78 Resilience detection akv (J/cm2): >98(10) Hardness: <197HB

30CrMo	4130	SCM430	25CrMo4(1.7218)	The first quenching heating temperature (°C): 880; coolant: water, oil The second quenching heating temperature (°C):- Tempering heating temperature (°C): 540; Coolant: water, oil Tensile strength (σb/MPa): ≥930 Yield point (σs/MPa): ≥785 Elongation after breaking (δ5/%): ≥12 Reduction of area (ψ/%): ≥50 Impact absorption (Aku2/J): ≥63 Brinell hardness (HBS100/3000) (annealed or high temperature tempered state) ≤ 229
35CrMo	4135	SCM435	34CrMo4(1.7220)	Tensile strength σb (MPa): ≥985(100) Yield strength σs (MPa): ≥835(85) Elongation δ5 (%): ≥12 Reduction of area ψ (%): ≥45 Impact energy Akv (J): ≥63 Impact toughness value αkv (J/cm²): ≥78(8) Hardness: ≤229HB
42CrMo	4142	SCM440	42CrMo4(1.7225)	Tensile strength σb (MPa): ≥1080(110) Yield strength σs (MPa): ≥930(95) Elongation δ5 (%): ≥12 Reduction of area ψ (%): ≥45 Impact energy Akv (J): ≥63 Impact toughness value αkv (J/cm2): ≥78(8) Hardness: ≤217HB

12CrMoV	—	—	—	The first quenching heating temperature (°C): 970; coolant: empty The second quenching heating temperature (°C):- Tempering heating temperature (°C): 750; coolant: empty Tensile strength σb (MPa): ≥440(45) Yield strength σs (MPa): ≥225(23) Elongation δ5 (%): ≥22 Reduction of area ψ (%): ≥50 Impact energy Akv (J): ≥78 Impact toughness value αkv (J/cm2): ≥98(10) Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≤ 241
12Cr1MoV	—	—	—	Tensile strength (σb/MPa): ≥490 Steel plate photo Steel plate photo Yield point (σs/MPa): ≥245 Elongation after breaking (δ5/%): ≤22 Reduction of area (ψ/%): ≥50 Impact absorption power (Aku2/J): ≥71 Impact toughness value αkv (J/cm2): ≥88(9) Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≤ 179 Under normal temperature: allowable tensile stress (σw/MPa): 93 allowable bending stress (σw/MPa): 112 allowable shear stress (T/MPa): 56

38CrMoAl	—	—	—	Tensile strength σb (MPa): ≥980(100) Yield strength σs (MPa): ≥835(85) Elongation δ5 (%): ≥14 Reduction of area ψ (%): ≥50 Impact energy Akv (J): ≥71 Impact toughness value αkv (J/cm2): ≥88(9) Hardness: ≤229HB
20CrMnMo	—	SCM421	—	Tensile strength (σb/MPa): ≥1180 Yield point (σs/MPa): ≥885 Elongation after breaking (δ5/%): ≥10 Reduction of area (ψ/%): ≥45 Impact absorption (Aku2/J): ≥55 Brinell hardness (HBS100/3000) (annealed or high temperature tempered state): ≤ 217 Tensile strength σb (MPa): ≥1080(110) Yield strength σs (MPa): ≥835(85) Elongation δ5 (%): ≥10 Reduction of area ψ (%): ≥45 Impact energy Akv (J): ≥55 Impact toughness value αkv (J/cm2): ≥69(7) Hardness: ≤217HB

20CrMnTi	—	—	—	Tensile strength σb (MPa): ≥1080(110) Yield strength σs (MPa): ≥835(85) Elongation δ5 (%): ≥10 Gear steel finished drawing Gear steel finished drawing Reduction of area ψ (%): ≥45 Impact energy Akv (J): ≥55 Impact toughness value αkv (J/cm2): ≥69(7) Hardness: ≤217HB