

U.S. Standard Materials Groupings

Material Group	Material Type	Hardness	USA Standards, SAE/AISI/UNS
Steel			
1.1	Magnetic soft steel	< 120 B	12L14, 12L15
1.2	Structural, case carburising	< 200 B	1005-1025, 1214, 1215, A36
1.3	Plain carbon steel	< 250 B	1030-1060, 1144-1146
1.4	Alloy Steel	< 250 B	4140, 4340, 52100,8620, H11-H41, A2, D2, O1, P20, 420
1.5	Alloy steel, hardened/tempered steel	350	4140, 4340, 52100,8620, H11-H41, A2, D2, O1, P20, 420
1.6	Alloy steel, hardened/tempered steel	> 350 B	4140, 4340, 52100,8620, H11-H41, A2, D2, O1, P20, 420
1.7	Alloy steel, hardened	49-55 C	A2, H10-H41, L1-L6, M1-M42, T1
1.8	Alloy steel, hardened	55-60 C	A2, H10-H41, L1-L6, M1-M42, T1
1.9	Alloy steel, hardened	>60C	A2, H10-H41, L1-L6, M1-M42, T1
Stainless Steel			
2.1	Free Machining Stainless	< 250 B	200, 303, 416, 420F, 430F,440
2.2	Austenitic	< 250 B	301,302,304,316,321,330,AM-350, Custom 455
2.3	Ferritic + Austenitic, Martensitic	< 300 B	318-329, 400-446, 15-4PH,17-4PH,Duplex
2.4	Precipitation Hardened	< 300 B	15-5PH, 17-4PH, Custom 450
Cast Iron			
3.1	Lamellar graphite	< 150	Grey, G10, Gg40, J431C, A48 Class 20
3.2	Lamellar graphite	>150<300	Grey, GG25-Gg40, J158, A48 Class 40-60
3.3	Nodular graphite, malleable cast iron	< 200	A220, A436, A439, A602, Black, GGG40-GGG70
3.4	Nodular graphite, malleable cast iron	>200<300	Black Gts/Gtw, J434C
Titanium			
4.1	Unalloyed	< 200	Commercially Pure
4.2	Alloyed	< 270	6A14V,6A14V-2Sn, Monel, Monel K
4.3	Alloyed	>270<350	6A14V-4Mo,7A14-V-4Mo, 4911-4967
Nickel			
5.1	Unalloyed	< 150	Commercially Pure
5.2	Alloyed	< 270	Monel 400, Hastelloy C, Inconel 625, Waspaloy
5.3	Alloyed	>270<350	Inconel 718, Nimonic 75-95, Rene 41,Inconel 825, A286
Copper			
6.1	Copper	< 100	Commercially Pure
6.2	β Brass, Bronze	< 200	314-340, 350-370
6.3	γ-Brass	< 200	Alloyed Cu + Al + Fe, Long Chipping
6.4	High Strength Bronze	< 470	Ampco 18-25
Aluminum, Magnesium			
7.1	Al,Mg, unalloyed	< 100	Commercially Pure
7.2	Al alloyed, Si<0.5%	< 150	6061 T6, 7075, 314-340
7.3	Al alloyed, Si>0.5%<10%	< 120	6061 T6, 380-390
7.4	Al alloyed, Si>10%	< 120	Magnesium Whisker Reinforced
Synthetic Materials			
8.1	Thermoplastics	n/a	Ultramid, Polystrol
8.2	Thermosetting plastics	n/a	Bakelite, Pertinax
8.3	Reinforced plastic materials	n/a	CFK, GFKAFK
Hard Materials			
9.1	Cermets (Metal-ceramics)	< 550	