

# Metal Material Properties Table 2

※Published data is for reference only

Material		Universal metals								
		Niobium	Copper	Aluminum	Iron	Stainless steel	Gold			
Data	Unit									
Material symbol		Ni	Cu	Al	S45C	SUS304	Ag			
Component amount [%]		99.0%~99.95%	99.9%~99.99%	99.0%~99.999%			99.99%~99.999%			
	Density	[g/cm <sup>3</sup> ]	8.90	8.90	2.70	7.83	7.90	10.50		
Machining properties	Hardness	Vickers hardness Hv1	[GPa]	0.90	0.80	0.50	2.45	2.00	0.88	
			[MPa]	335	195	55	828	520		
	Tensile strength	20°C	[MPa]							
		600°C	[MPa]							
		800°C	[MPa]							
		1000°C	[MPa]							
		Yield strength	[MPa]							
		Dilation	[%]							
		Flexural rigidity	[GPa]							
	Young's modulus	[GPa]	209	130	71	210	200	73		
	Poisson's ratio	-								
Thermal properties	Max. use temp.	Depending on atmosphere	[°C]		400	400	550	700		
	Recrystallization temperature		[°C]							
	Melting point		[°C]	1455	1084	660	1535	1450	960	
	Boiling point		[°C]							
	Linear expansion coefficient	RT	[*10 <sup>-6</sup> /°C]							
		RT~100°C	[*10 <sup>-6</sup> /°C]	13.7	16.6	23.2	11.9	18.0	19.0	
		RT~500°C	[*10 <sup>-6</sup> /°C]							
		RT~1000°C	[*10 <sup>-6</sup> /°C]							
		RT~1500°C	[*10 <sup>-6</sup> /°C]							
	Thermal conductivity	20°C	[W/(m·K)]	91	398	237	41	16	420	
		100°C	[W/(m·K)]							
500°C		[W/(m·K)]								
1000°C		[W/(m·K)]								
1500°C		[W/(m·K)]								
	Specific heat	[J/(kg·K)]	440	380	900	440	502	233		
Electrical characteristics	Electric conductivity	[%I.A.C.S]								
	Volume resistivity	20°C	[μΩ·cm]	7.0	1.7	2.7	10.0	72.0	1.6	
Magnetic characteristics	Permeability	[Km]								
	Susceptibility	[Xm]								
Chemical reactivity	Liquid	hydrochloric acid	Loss							
		hydrochloric acid	Loss							
		sulfuric acid	Loss							
		sulfuric acid	Loss							
		nitric acid	Loss							
		caustic soda (sodium hydroxide)	Loss							
		caustic soda (sodium hydroxide)	Loss							
	Gas	air or oxygen	Loss							
		air or oxygen	Loss							
		vapor	Loss							
		nitrogen	Loss							
		carbon monoxide	Loss							
		carbon dioxide	Loss							
		hydrogen	Loss							
		hydrofluoric acid	Loss							
		chlorine	Loss							
		bromine	Loss							
		iodine	Loss							
		ammonia	Loss							
	Solid body	hydrogen sulfide	Loss							
sulfur		Loss								
carbon, graphite		Loss								
Features & applications										
Remarks										