Metal Material Properties Table 2

※Published data is for reference only

Material / Data / Unit				Universal metals					
				Niobium	Copper	Aluminum	Iron	Stainless steel	Gold
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^3]	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
	Tensile strength	20℃	[MPa]	335	195	55	828	520	
		600℃	[MPa]						
		800℃	[MPa]						
		1000℃	[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	[℃]		400	400	550	700	
	Recrystallization temperature		[℃]						
	Melting point		[℃]	1455	1084	660	1535	1450	960
	Boiling point		[℃]						
	Linear expansion coefficient	RT	[*10^{-6}/℃]						
		RT～100℃	[*10^{-6}/℃]	13.7	16.6	23.2	11.9	18.0	19.0
		RT～500℃	[*10^{-6}/℃]						
		RT～1000℃	[*10^{-6}/℃]						
		RT～1500℃	[*10^{-6}/℃]						
	Thermal conductivity	20℃	[W/(m･K)]	91	398	237	41	16	420
		100℃	[W/(m･K)]						
		500℃	[W/(m･K)]						
		1000℃	[W/(m･K)]						
		1500℃	[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℃	[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						
		hydrogen sulfide	Loss						
	Solid body	sulfur	Loss						
		carbon, graphite	Loss						
Features & applications									
Remarks									