

Shape-Memory Alloy

DESCRIPTION

Shape-memory alloy is an Ni-Ti alloy produced through exclusive extra-clean melting process. It exhibits shape-memory and super-elastic characteristics after being subjected to heat treatment. Our product has been shaped at a specific temperature, reheating it to the set temperature automatically restore its original shape if it has been deformed at a temperature below the original set temperature; even if it has been severely bent at a temperature exceeding the set temperature, removing the bending stress will return the alloy to its original shape.

CHEMICAL COMPOSITION AND SHAPE-RECOVERY TEMPERATURE

ALLOY		Ni	Ti	Co	Cu	Shape-recover temperature
Ni-Ti	Min.	54	Bal			20~100°C
	Max.	56				
Ni-Ti-Co	Min.	53	Bal	1		-30~30°C
	Max.	55		3		
Ni-Ti-Cu	Min.	47	Bal		5	40~70°C
	Max.	50			9	
Note		Shape-recovery temperature varies depending on forming and heat treatment conditions				

MECHANICAL PROPERTIES

Alloy	Tensile strength		Yield strength		Elongation	Horizontal modulus of Elasticity	
	MPa	kgf/mm ²	MPa	kgf/mm ²	%	MPa	kgf/mm ²
Martensitic Phase							
Ni-Ti	1175~1370	120~140	≤ 196	≤ 20	≤ 50	7845~9800	800~1000
Ni-Ti-Co	1370~1570	140~160	≤ 294	≤ 30	≤ 50	9800~13730	1000~1400
Ni-Ti-Cu	1175~1765	120~180	68~98	7~10	≤ 20	≤ 4900	≤ 500
Austenitic Phase							
Ni-Ti	1075~1175	110~120	390~785	40~80	≤ 20	17650~21575	1800~2200
Ni-Ti-Co	1275~1370	130~140	490~980	50~100	≤ 20	19600~24500	2000~2500
Ni-Ti-Cu	1175~1765	120~180	390~785	40~80	≤ 20	19615~27460	2000~2800
Note	Mechanical properties vary depending on heat treatment conditions and service temperatures						

MECHANICAL PROPERTIES

	Density (g/cm ³)	Melting Point (°C)	Linear expansion coefficient (x10 ⁻⁶ /K)	Specific Heat (J/(kg·K))	Thermal Conductivity (W/(m·K))	Specific Electric Resistance (x10 ⁻⁸ Ω m)
Austenitic Phase						
Ni-Ti	6.5	1250~1280	10	440	12.1	80~100
Ni-Ti-Co	6.5	1250~1280	-	470	12.7	-
Ni-Ti-Cu	6.4	1250~1270	-	460	13.5	-
Note	Physical properties, except for density and melting point, of Ni-Ti alloy vary depending on temperature					