

Kovar alloy

Kovar is a special low-expansion iron-nickel-cobalt alloy of closely controlled chemical composition. It is characterized by an almost linear variation of coefficient of thermal expansion between room temperature and the Curie temperature 430°C. Its expansion characteristics are very similar to those of many medium-hard borosilicate glasses and ceramics. Therefore it can ensure good sealing and vacuum tightness in glass or ceramic-to-metal seals. It is characterized by:

- extremely low coefficient of thermal expansion between -100 and 450°C
- good ductility and formability

Chemical Composition, %

element	Ni	Fe	Co	Mo	Cr	Cu	C	Mn	Si	Al	Ti	Mg	Zr
min.	29	53	17										
max.				0.20	0.20	0.20	0.04	0.50	0.20	0.10	0.10	0.10	0.10

chemical Composition according to ASTM F15, K94610. Some compositional limits of other specifications may vary slightly.

Designation and standards

National Standards	Material designation	Chemical composition	Forgings	Rod and bar	Plate and sheet	Strip	Wire
ASTM	UNS K94610	ASTM F15	ASTM F15	ASTM F15	ASTM F15	ASTM F15	ASTM F15
DIN	1.3981 NiCo 29 18	DIN 17745	DIN 17745	DIN 17745	DIN 17745	DIN 17745	DIN 17745
GB/T	4J29	YB/T 5231	YB/T 5231	YB/T 5231	YB/T 5231	YB/T 5231	YB/T 5231

Density 8.30g/cm³

Corrosion resistance

- corrosion resistant in dry atmospheres at room temperature
- Corrosion can occur in the form of rust in humid or moist atmospheres.

Applications

Typical applications are:

- electronic elements and components to be sealed to hard glasses and ceramics, actuators
- lead wires, lead frames and transistor caps
- X-ray tubes and other hermetic sealing application