

Kovar ASTM F 15 Alloy

DESCRIPTION

Kovar, also known as Alloy V29-17, UNS K94610, DIN 1.3981, ASTM F-15, A54-301, and NILO K, is a nickel-cobalt-iron alloy known for its low coefficient of thermal expansion and its compatibility with glass and ceramics.

TYPICAL PHYSICAL PROPERTIES

Density	lb/cu in	0.302
Specific Gravity		8.36
Curie Temp	°F	815
	°C	435
Melting Point	°F	2640
	°C	1450
Electrical Resistivity (70 °C)	ohm-cir mil/ft	294
	Microhms-cm	49
Thermal Conductivity	BTU-in/sq.ft-hr°F	120
	W/cm °C	0.17
Specific Heat	Cal/gm°C	0.11
	BTU-lbm-°F	0.11

AVERAGE LINEAR COEFFICIENT OF THERMAL EXPANSION $\mu\text{m}/\text{m}\cdot\text{°C}$

Temp Range 77°F to	Coefficient 10-6/°F	Temp Range 25°C to	Coefficient 10-6/°C	ASTM F15 CTE 30°C to $\mu\text{m}/\text{m}\cdot\text{°C}$
212°F	3.25	100°C	5.86	4.60 to 5.20 5.10 to 5.50
392°F	2.89	200°C	5.20	
572°F	2.85	300°C	5.13	
662°F	2.72	350°C	4.89	
752°F	2.81	400°C	5.06	
842°F	2.9	450°C	5.25	
932°F	3.41	500°C	6.15	
1112°F	4.34	600°C	7.80	
1292°F	5.06	700°C	9.12	
1472°F	5.73	800°C	10.31	
1652°F	6.25	900°C	11.26	

APPLICATIONS

Power tubes, microwave tubes, transistors, diodes and hybrid packages.

TYPICAL MECHANICAL PROPERTIES

Tensile Strength	ksi (MPa)	75 (517)
*Sheet + Strip	ksi (MPa)	82 (570) max
*Rod + Wire	ksi (MPa)	85 (585) max
Yield Strength	ksi (MPa)	50 (345)
Elongation	% in 2"	30
Typical Hardness Ann.	Rockwell B	68
Modulus of Elasticity	ksi (GPa)	20,000 (138)
Poisson's Ratio		0.317

Chemical Composition (% by weight)

Elements	Min	Max
C	-	0.04
Mn	-	0.50
Si	0.20	-
Ni	29.0	-
Fe	53.0	-
Co	17.0	-
Al	-	0.10
Cr	-	0.20
Mg	-	0.10
Zr	-	0.10
Ti	-	0.10
Cu	-	0.20
Mo	-	0.20

Special Purpose Alloys & Metals From Stock

Controlled Expansion | Glass Sealing

Kovar ASTM F 15 Alloy

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

Alloy 32/42/48/49

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

VIM VAR CORE IRON

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

SUPRA 510 (Ni50FeCr10)

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

TITANIUM ALLOYS

TITANIUM TI-6AL-4V GRADE 5

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

TITANIUM GRADE 2

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

TITANIUM 6-2-4-6

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

TITANIUM BT20

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

PH ALLOYS

17-7PH

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

15-5PH

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

17-4PH

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

ALUMINIUM HARD ALLOYS

7475 AA7475/7449 AA7449

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

7075 UNS A97075

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

7050 AMS 4050

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

7175 UNS A97075

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

2014 AMS 4121

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

2024 UNS A92024

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

2618 UNS A92618

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

2017 AMS 4037

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

2011 UNS A92011

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

NICKEL BASED ALLOYS

WASPALLOY

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

INCONEL X750

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

INCONEL 945

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

INCONEL 945X

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

NIMONIC C263

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

NIMONIC 75

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

INCONEL 909

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

INCONEL 718

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

INCONEL 660

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

HIGH TEMP ALLOYS

HAYNES 188

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

L605

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

MP35N

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

MP159

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

RENE41

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

HAYNES 230

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

ELGILOY

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

HAYNES 242

- Forms: Plate, sheets, Round Bar, Rod, Strips, Coil

JUST-IN-TIME DELIVERY: All of our standard stock items can be delivery as per commitment. All materials are certified with shipment. For special orders and non-stock materials, contact our sales team for our competitive pricing and delivery.