

Alloy-49

DESCRIPTION

Alloy 49, also known as Invar 49, is a nickel-iron alloy characterized by its low coefficient of thermal expansion. While its expansion rate is slightly higher than Alloy 48, it is still highly suitable for precision applications where minimal thermal distortion is crucial.

TYPICAL PHYSICAL PROPERTIES

Density	lb/CU in	0.295
Specific Gravity		8.18
Curie Temp	°F	840/930
	°C	449/499
Melting Point	°F	2600
	°C	1427
Electrical Resistivity	ohm-cir mil/ft	290
	Microhms-cm	480
Thermal Conductivity	BTU-in/sq.ft-hrOF	90
	w/cm oc	13
Specific Heat	BTU/lbOF	0.12

Chemical Composition (% by weight)

Elements	Min	Max
C	-	0.035
Mn	-	0.8
Si	-	0.5
P	-	0.02
S	-	0.008
Ni	47.0	50.0
Fe		Balance

APPLICATIONS

Alloy 49 is used in research equipment and devices where maintaining exact measurements and stability across varying temperatures is essential for experimental accuracy.

TYPICAL MECHANICAL PROPERTIES

Hardness, Rockwell B	100
Tensile Strength, Ultimate	896 MPa
	130000 psi
Tensile Strength, Yield	159 MPa
	23000 psi
Elongation at Break	5.0%
Reduction of Area	65%
Modulus of Elasticity	166 GPa
	24100 ksi

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

CTE, linear	8.28	4.60
	$\hat{\text{A}}\mu\text{m}/\text{m}\cdot\hat{\text{A}}^{\circ}\text{C}$	$\hat{\text{A}}\mu\text{in}/\text{in}\cdot\hat{\text{A}}^{\circ}\text{F}$
	@Temperature	@Temperature
	25.0 - 204 $\hat{\text{A}}^{\circ}\text{C}$	25.0 - 204 $\hat{\text{A}}^{\circ}\text{C}$
Specific Heat	0.502 J/g- $\hat{\text{A}}^{\circ}\text{C}$	0.120
Capacity		BTU/lb- $\hat{\text{A}}^{\circ}\text{F}$
Thermal	13.0 W/m-K	90.2 BTU-in/hr-
Conductivity		ft $\hat{\text{A}}^2$ - $\hat{\text{A}}^{\circ}\text{F}$
Melting Point	1430 A $^{\circ}\text{C}$	2600 A $^{\circ}\text{F}$

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

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

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

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

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

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.