Elgiloy Specialty Metals Material Datasheet

HAYNES® 233™ Alloy

UNS: N/A
W.Nr: N/A

Description: HAYNES® 233™ alloy is a new Ni-Cr-Co-Mo-Al alloy formulated with excellent creep strength (akin to HAYNES 230® alloy) and with oxidation resistance approaching that of HAYNES 214® alloy. The alloy is also readily fabricable, exhibiting good hot workability, cold formability, and weldability. The alloy obtains its oxidation resistance via the formation of a protective alumina layer and high creep strength through solid solution and carbide strengthening. The alloy can be age hardened by heat treatment to produce even greater strength.

Applications include: Gas turbine components, Industrial heating fixtures, Structural components

Industries supplied include: Aerospace, Industrial Heat Treating, Power Generation

Nominal Composition

	C	Mn	Si	Ni	Cr	Co	Mo	Fe	Ti	Al	Ta	W	B	Zr	Y
min	0.05	0.10	0.040	BAL	18.00	18.00	7.00	-	0.40	3.00	0.40	-	-	-	-
max	0.12	0.40	0.20	-	20.00	20.00	8.00	1.50	0.60	3.50	0.80	0.30	0.006	0.050	0.025

Physical Properties

	At 70°F	At 20°C
Density	0.296 lb/in^3	8.18 g/cm^3
Coefficient of Expansion	7.8 microinches/in.-°F (1200°F)	13.8 µm/m-°C (600°C)
Electrical Resistivity	54.4 µohm-in	137 µohm-cm
Thermal Conductivity	138 Btu-in./ft.^{2}hr.-°F	19.1 W/m-K

Applicable Specifications

Strip	N/A

Typical Mechanical Properties

Condition	Heat Treatment	Tensile Strength	Suggested Operating Conditions
Annealed	2125-2150°F (1163-1177°C)	140 ksi (965 MPa)	70°F to 2100°F (20°C to 1149°C)
Age-Hardened	1650°F/4h/AC + 1450°F/8h/AC (899°C/4h/AC + 788°C/8h/AC)	170 ksi (1172 MPa)	70°F to 1400°F (20°C to 760°C)

Elgiloy Specialty Metals
1565 Fleetwood Drive
Elgin, IL 60123

WWW.ELGILOY.COM

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