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.-^{o}F (1200^{o}F)	13.8 µm/m-^{o}C (600^{o}C)
Electrical Resistivity	54.4 µohm-in	137 µohm-cm
Thermal Conductivity	138 Btu-in./ft.^{2}hr.-^{o}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

LIMITATION OF LIABILITY AND DISCLAIMER OF WARRANTY:

The content in these data sheets is provided primarily by third-party melting mills and is provided for reference only. It is not intended for engineering or design.

Applications may be discussed, however, Elgiloy Specialty Metals does not recommend or endorse any material for any particular end use or application.

The data included in this data sheet are typical values and may vary.

Elgiloy Specialty Metals makes no representations or warranties, express or implied, as to the accuracy, completeness, condition, suitability, performance, fitness for a particular purpose, or merchantability of any information contained in any data sheet.

In no event will Elgiloy Specialty Metals be liable for any damages whatsoever arising from the use of the information included in the data sheets.