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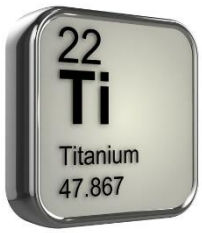
aceros especiales

MATERIAL NO. TITANIUM GRADE 12 EN 3.7105



Chemical Composition

The chemical composition of grade 12 Ti 0.3 Mo 0.8 Ni alloy is outlined in the following table.

Element	Content (%)
Nickel, Ni	0.6 - 0.9
Iron, Fe	0.3 max
Molybdenum, Mo	0.2 - 0.4
Oxygen, O	0.25 max
Carbon, C	0.08 max
Nitrogen, N	0.03 max
Hydrogen, H	0.015 max
Titanium, Ti	Remainder

Physical Properties

The physical properties of grade 12 Ti 0.3 Mo 0.8 Ni alloy are tabulated below.

Properties	Metric	Imperial
Density	4.50 g/cm^3	0.163 lb/in^3
Melting point	≤ 1660°C	≤ 3020°F

Mechanical Properties

The following table shows mechanical properties of grade 12 Ti 0.3 Mo 0.8 Ni alloy.

Properties	Metric	Imperial
Tensile strength	550 MPa	79800 psi
Yield strength	380 MPa	55100 psi
Poisson’s ratio	0.37	0.37

Elastic modulus	105 GPa	15200 ksi
Shear modulus	45.0GPa	6530 ksi
Elongation at break	12 %	12 %
Hardness, Brinell	180 - 235	180 - 235
Hardness, Knoop	222	222
Hardness, Rockwell C	11	11
Hardness, Vickers	209	209

Thermal Properties

The thermal properties of grade 12 Ti 0.3 Mo 0.8 Ni alloy are tabulated below.

Properties	Metric	Imperial
Thermal expansion co-efficient (@0.000-100°C/32-212°F)	8.60 µm/m°C	4.78 µin/in°F
Thermal conductivity	19 W/mK	132 BTU in/hr.ft².°F

Machinability

Grade 12 Ti 0.3 Mo 0.8 Ni alloy can be machined using slow speeds, right quantity of coolant flow and high feed rates. High-speed tools should be used for tooling this alloy and the recommended tool types are tungsten carbide designations C1-C4 or cobalt based.

Forming

Grade 12 Ti 0.3 Mo 0.8 Ni alloy can be hot or cold formed.

Welding

Weldabilty of grade 12 Ti 0.3 Mo 0.8 Ni alloy is rated as excellent.

Forging

Rough forging can be performed at 871°C (1600°F) and completed at 788-843°C (1450-1550°F)

Hot Working

Hot working enhances the overall ductility of the material.

Cold Working

Cold working features of this material is same as that of austenitic stainless steel. Post-work annealing is recommended to re-attain favorable performance properties.

Applications

Grade 12 Ti 0.3 Mo 0.8 Ni alloy is used in the following application areas:

- Pumps
- Valves
- Heat exchangers
- Seamless and welded Pipes and fittings
- Chemical processing
- In high temperature chemical manufacturing equipment
- Marine and airframe components
- In medium reducing or variable oxidizing-reducing media - containers