Aluminum alloys

Category:
High temperature strength
Nanocrystalline

Aluminum-alloy Al-MS95B

Aluminum alloy Al-MS95B is a nanocrystalline high temperature Aluminum alloy made via powder metallurgy. The nanocrystalline structure is stable up to 400°C. The high strength that stays stable even after hundreds of hours thermal exposure makes Al-MS95B very attractive for high temperature applications.

General properties

- Very high strength at elevated temperatures
- Higher modulus than standard alloys
- Excellent machining behavior
- High fatigue strength at elevated temperatures

Comparison with Standard alloys A4032, A2618

- Advantages: - 20% higher stiffness, A4032
- Disadvantages: - 35% higher fatigue than A4032, A2618
- Higher density

Chemical Composition: Al-Cu-Ni-Fe

Mechanical properties, Physical data

Density: 2.92 g/cm³
CTE: 19 x 10^-6
Tensile strength (20°C): 630 MPa
Yield strength (20°C): 580 MPa
Elastic Modulus: 92 GPa
Hardness (HV30): >170
Thermal conductivity: 145 W/mK

Applications

- Pistons
- Structural parts
- Connecting rods
- Hydraulic valve blocs

Delivery form

- Bars
- Billets
- Plates
- Extrusions
Typical properties of Al-MS95B

**Strength vs. Temperature**

![Graph showing strength vs. temperature](image)

Fig. 1: Strength versus temperature of Al-MS95 and A2618.

**Tensile strength vs. Annealing time**

![Graph showing tensile strength vs. annealing time](image)

Fig. 2: Tensile and Yield strength of Al-MS95 and A2618 after different annealing times.

**Temperature/°C** | **Rt = -1** | **Elongation**
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Rt | 218 MPa | 6%
150 | 205 MPa | 12%
250 | 194 MPa | 27%
300 | 164 MPa | 32%

Fig. 3: Fatigue strength, Elongation of Al-MS95