

MECHANICAL PROPERTIES

STRENGTH

The mechanical properties of beryllium vary with the production method used. At elevated temperatures up to 816°C, beryllium retains useful strength while other structural metals such as aluminium and magnesium have exceeded their melting point.

RIGIDITY

One of Be's most outstanding features is high elastic modulus and the resultant stiffness-to-density ratio. Be has a modulus of elasticity of 303 Gpa, 4 times that of Aluminium, 2.5 times that of titanium. For light weight applications requiring a high specific modulus of elasticity, Be is unsurpassed.

COMPRESSIVE YIELD STRENGTH

The compressive yield strength (0.2% offset) at room temperature of Be is typically 10 % higher than the tensile yield strength. At 204°C, the compressive yield strength is equal to the tensile yield strength. This is a unique property of Be.

FATIGUE

Beryllium has an unusually high resistance to fatigue cracking and a high endurance strength level. Fatigue tests have shown that for hot-pressed block, the endurance limit is near the static yield strength. Based on its ratio of fatigue strength to density, Be appears truly outstanding compared to both aluminium and titanium.

MINIMUM TENSILE PROPERTIES

| | S200F | S200FH | S65 | S65H | I220H |
|----------------------|--------------|---------------|------------|-------------|--------------|
| Yield strength (Mpa) | 241 | 296 | 207 | 207 | 344 |
| UTS (Mpa) | 324 | 414 | 290 | 345 | 448 |
| Elongation (%) | 2 | 3 | 3 | 2 | 2 |

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