

# 8090 Aluminium Lithium

Smiths High Performance



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## Greater stiffness & reduced density

8090 is a medium-strength aluminium lithium alloy which combines higher stiffness with reduced density.

The wrought alloy is particularly interesting to the aerospace sector in producing high-technology components due to being 10% less dense compared to comparable alloys with an increase in elastic modulus of 11%.

The motorsport sector also utilises 8090 aluminium lithium for producing pistons, brake callipers, metallic inserts for composite structures, structural engine parts, and fasteners. The alloy is popular in the defence sector too, as a light-weighting solution while still providing strength.

8090 serves as a natural alternative to 2014 & 2024 aluminium alloys due to the material's impressive mechanical properties. The alloy is precipitation hardenable with good strength, formability, and weldability. It also offers significantly increased toughness and strength during exposure to cryogenic temperatures.

Our product is highly suitable for applications with critical requirements for damage tolerance and low density.



## Benefits:

- Low density
- High stiffness
- Medium Strength
- Excellent weldability by conventional methods
- Excellent cryogenic temperature performance

## Typical Applications:

- Pistons
- Brake callipers
- Engine parts
- Electrical components

## About Smiths High Performance

Smiths High Performance is a leading stockholder and supplier of high-performance engineering materials. We are material supply chain partners supporting high-technology market sectors.



Further technical data available on the reverse of this Datasheet

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## \*Chemical Composition (weight %)

|      | Al  | Li   | Cu   | Mg   | Fe   | Zn   | Si   | Ti   | Cr   | Mn   | Zr    | Others (each) | Others (total) |
|------|-----|------|------|------|------|------|------|------|------|------|-------|---------------|----------------|
| Min: | Rem | 2.20 | 1.00 | 0.60 | 0.30 | 0.25 | 0.20 | 0.10 | 0.10 | 0.10 | 0.040 | 0.05          | 0.15           |
| Max: | Rem | 2.70 | 1.60 | 1.30 | 0.30 | 0.25 | 0.20 | 0.10 | 0.10 | 0.10 | 0.16  | 0.05          | 0.15           |

\* Properties as per BS EN 573-3

## Mechanical Properties

| Properties   | Metric      | Imperial             |
|--|-------------|----------------------|
| Tensile strength   | 450 MPa     | 65300 psi            |
| Yield strength   | 370 MPa     | 53700 psi            |
| Elongation at break  | 7%          | 7%                   |
| Elastic modulus  | 77 GPa      | 11200 ksi            |
| Shear strength   | 270 MPa     | 39200 psi            |
| Hardness, Brinell (@load 500 kg; thickness 10.0 mm)          | 121         | 121                  |
| Hardness, Knoop (converted from Brinell hardness value)      | 151         | 151                  |
| Hardness, Rockwell A (converted from Brinell hardness value) | 47.2        | 47.2                 |
| Hardness, Rockwell B (converted from Brinell hardness value) | 75          | 75                   |
| Hardness, Vickers (converted from Brinell hardness value)    | 137         | 137                  |
| Thermal expansion co-efficient (@20-100°C/68-212°F)          | 21.4 µm/m°C | 11.9 µin/in°F        |
| Thermal conductivity   | 95.3 W/mK   | 661 BTU in/hr.ft².°F |

## Use in Space Exploration

8090 aluminium lithium alloy is an advanced engineering raw material and finds use in various high-technology markets. For example, the Titan IV rocket's payload adaptor (which connects the launch vehicle and the orbiter) was produced using 8090 aluminium lithium. The material is a 2nd generation aluminium lithium alloy which was developed for commercial use in the 1970s.



## ...where performance matters...

When you purchase high-performance materials from **Smiths High Performance**, you will join some of the biggest and best global engineering companies. We are a Tier 1 supply chain partner to the world's leading motorsport companies. Our unique business structure and ethos allow us to offer services otherwise unavailable in this market sector.

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