

## METAL SOLUTIONS

# EOS Aluminium ALF357

## Material Data Sheet

## EOS ALUMINIUM ALF357

## Light Weight & Corrosion Resistance

EOS Aluminium ALF357 is an ideal material for applications requiring a combination of low weight and mechanical/thermal load endurance. It is a beryllium free derivative of the A357 (AlSi7Mg0.6) alloy. Parts built of EOS Aluminium ALF357 can be machined, shot-peened and polished in the as-built or heat treated state. For this product, a T6-like heat treatment may be utilized to enhance the overall mechanical properties.

### MAIN CHARACTERISTICS

- Light-weight
- Corrosion resistance
- High dynamic load bearing capacity

### TYPICAL APPLICATIONS

- Aerospace industry applications
- Defense and automotive industries
- Structural components requiring high strength

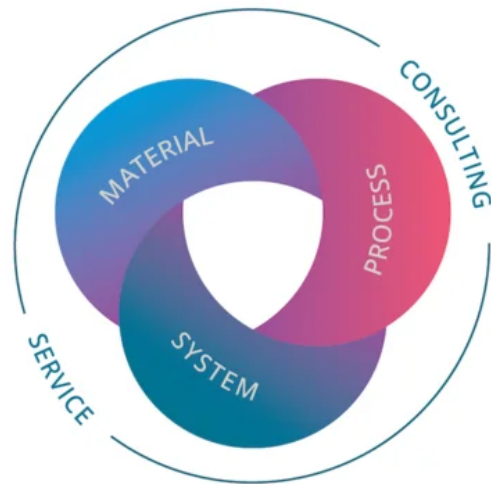
# The EOS Quality Triangle

EOS uses an approach that is unique in the AM industry, taking each of the three central technical elements of the production process into account: the system, the material and the process. The data resulting from each combination is assigned a Technology Readiness Level (TRL) which makes the expected performance and production capability of the solution transparent.

EOS incorporates these TRLs into the following two categories:

- Premium products (TRL 7-9): offer highly validated data, proven capability and reproducible part properties.
- Core products (TRL 3 and 5): enable early customer access to newest technology still under development and are therefore less mature with less data.

All of the data stated in this material data sheet is produced according to EOS Quality Management System and international standards



# POWDER PROPERTIES

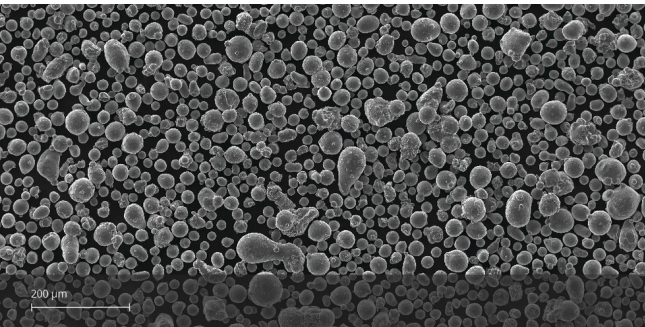
Chemical composition of the EOS Aluminium AlF357 powder is in compliance with SAE AMS 4289 standard.

## Powder Chemical Composition (wt.-%)

Element	Min.	Max.
Al		Balance
Si	6.5	7.5
Fe	-	0.1
Cu	-	0.2
Mn	-	0.1
Mg	0.4	0.7
Zn	-	0.1
Ti	0.04	0.2
Be	-	0.002
Other Elements Each	-	0.05
Other Elements Total	-	0.15

## Powder Particle Size

GENERIC PARTICLE SIZE DISTRIBUTION	20 - 90 µm
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SEM micrograph of EOS Aluminium AlF357 powder

# HEAT TREATMENT

## Description

Laser melting process comprises extremely fast melting and re-solidification. Due to the layerwise manufacturing method, the parts exhibit anisotropic properties depending on the building direction. Suitable heat treatments can be used to meet the needs of various applications, e.g. to reduce the anisotropy. Conventionally cast components of this type of aluminum alloy are often heat treated using a T6 cycle consisting of solution annealing, quenching and age hardening. A T6-like heat treatment has been specifically developed to increase the ductility and yield strength, and to reduce the anisotropy of the built parts, consisting of the following cycles:

## Steps

**Solution Annealing:** 30 minutes at 540 °C ( $\pm 6$  °C) measured from the part, followed by instant quenching in water at room temperature.

**Aging:** 6 hours at 165 °C ( $\pm 6$  °C) measured from the part, followed by air cooling. This step is carried out with a maximum delay of 40 hours after the solution annealing. The mechanical properties for the heat treated condition have been attained through the described heat treatment procedure.

## HEADQUARTERS

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This powder has not been developed, tested or certified as a medical device according to Directive 93/42/EEC (MDD) or Regulation (EU) 2017/745 (MDR) and is not intended to be used as a medical device, in particular for the purposes specified in Art. 2 No. 1 MDR. Insofar as you intend to use the powder as raw material for the manufacture of pharmaceutical products or medical devices (e.g. as raw material which as a material must meet the requirements of Annex 1, Chapter II MDR), the responsibility and liability for all analyses, tests, evaluations, procedures, risk assessments, conformity assessments, approval and certification procedures as well as for all other official and regulatory measures required for this purpose shall lie solely with you both with regard to the pharmaceutical product and/or medical device manufactured by you and with regard to the properties, suitability, testing, evaluation, risk assessment, other requirements for use of the powder as raw material. In this respect, the limitations of liability pursuant to our General Terms and Conditions and the system sales or material contracts shall apply.

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**The achievement of certain part properties as well as the assessment of the suitability of this material for a specific purpose is the sole responsibility of the user. Any information given herein is subject to change without notice.**

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Status as of 03.09.2024. Subject to technical modifications. EOS is certified according to ISO 9001.

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