METAL SOLUTIONS

EOS NickelAlloy HAYNES® 282®

Material Data Sheet

EOS NICKELALLOY HAYNES® 282®

EOS NickelAlloy HAYNES® 282® is a precipitation strengthened nickel-base superalloy with a unique combination of high temperature strength, thermal stability, and fabricability. HAYNES® 282® alloy was developed for high temperature structural applications and is manufactured under license from Haynes International Inc. EOS NickelAlloy HAYNES® 282® is a nickel alloy powder intended for manufacturing parts on EOS metal systems with EOS DMLS processes.

MAIN CHARACTERISTICS

- → Excellent strength at high temperature
- → Good corrosion and oxidation resistance
- → Easily fabricated and excellent weldability

Download Process Data Sheet (PDF) →

TYPICAL APPLICATIONS

- → Aerospace and rocket engine components
- → Turbomachinery and gas turbine parts
- → Energy industry components

The EOS Quality Triangle

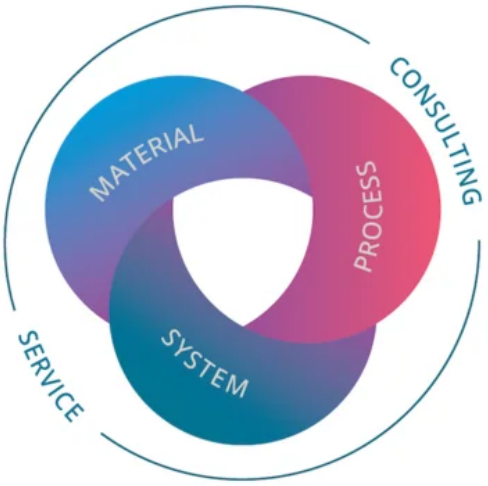
EOS uses an approach that is unique in the AM industry, taking each of the three central technical elements of the production process into account: the system, the material and the process. The data resulting from each combination is assigned a Technology Readiness Level (TRL) which makes the expected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

Powder composition is compliant with AMS5951 Rev. A Section 3.1 and UNS N07208.

Powder Chemical Composition (wt.-%)

Element	Min.	Max.
Cr	18.5	20.5
Co	9	11
Mo	8	9
Ti	1.9	2.3
Al	1.38	1.65
C	0.04	0.08
B	0.003	0.01
Ni	Balance	
Mn	0	0.3
Si	0	0.15
W	0	0.5
Nb	0	0.2
Ta	0	0.1
Fe	0	1.5
Cu	0	0.1
S	0	0.015
P	0	0.015

Powder Particle Size

GENERIC PARTICLE SIZE DISTRIBUTION	**20 - 55 µm**

HEAT TREATMENT

Description

In as-built condition EOS NickelAlloy HAYNES® 282® has low strength and high ductility. Solution and aging heat treatments are required to produce the microstructure and strengthening phases for high temperature performance.

EOS has characterized two heat treatment options, which are described below. Heat treatment Option 1 is recommended for properties closest to wrought HAYNES® 282®.

Option 1: Recrystallization solution treatment + standard two-step aging

Option 2: Standard solution + standard two-step aging

Steps

Heat Treatment Option 1

This heat treatment results in a recrystallized microstructure with larger and more equiaxed grains than are typically found in DMLS materials. The resulting mechanical properties are isotropic, with high tensile ductility and good creep-rupture strength.

Solution treatment

Step 1: Hold at 1 250 °C (2 282 °F) for 2 hrs, followed by rapid cooling (110 °C/min (230 °F/min) or faster) to room temperature.

Aging treatment

Step 2: Hold at 1 010 °C (1 850 °F) for 2 hrs, followed by cooling equivalent to air cooling (approx 20 °C/min (68 °F/ min) or faster) to room temperature. Step 3: Hold at 788 °C (1 450 °F) for 8 hrs, followed by cooling equivalent to air cooling (approx 20 °C/min (68 °F/ min) or faster).

Heat Treatment Option 2: This heat treatment results in fine grains with high aspect ratio. Higher strength and more anisotropy may be expected relative to heat treatment Option 1.

Solution treatment

Step 1: Hold at 1 135 °C (2 075 °F) for 2 hrs, followed by rapid cooling (110 °C/min (230 °F/min) or faster) to room temperature.

Aging treatment

Step 2: Hold at 1 010 °C (1 850 °F) for 2 hrs, followed by cooling equivalent to air cooling (approx 20 °C/min (68 °F/ min) or faster) to room temperature.

Step 3: Hold at 788 °C (1 450 °F) for 8 hrs, followed by cooling equivalent to air cooling (approx 20 °C/min (68 °F/ min) or faster).

HEADQUARTERS

EOS GmbH
Electro Optical Systems

Robert-Stirling-Ring 1
82152 Krailling / Munich
Germany

Tel.: +49 89 893 36-0
Email: info@eos.info
URL: www.eos.info

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.

Part properties are provided for information purposes only and EOS makes no representation or warranty, and disclaims any liability, with respect to actual part properties achieved. Part properties are dependent on a variety of influencing factors and therefore, actual part properties achieved by the user may deviate from the information stated herein. This document does not on its own represent a sufficient basis for any part design, neither does it provide any agreement or guarantee about the specific properties of a material or part or the suitability of a material or a part for a specific application.

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.

Status as of 19.06.2026. Subject to technical modifications. EOS is certified according to ISO 9001.