METAL SOLUTIONS

EOS StainlessSteel 17-4PH

Material Data Sheet

EOS STAINLESSSTEEL 17-4PH

Precipitation hardening steels are widely used in engineering applications, which require corrosion resistance and strength. Parts built from EOS StainlessSteel 17-4PH can be machined, shot-peened and polished in as-built or heat treated states. Solution annealing together with ageing treatment are necessary in order to achieve proper hardness and mechanical properties (ASTM A564 – 13). Due to the layerwise building method, the parts have a certain anisotropy which can be eased by solution annealing.

MAIN CHARACTERISTICS

- Corrosion resistance and strength
- Parts can be machined, shot-peened and polished in asbuilt or heat treated states
- Solution annealing together with aging treatment are necessary in order to achieve proper hardness and mechanical properties (ASTM A564-13)
- Chemical composition and part properties corresponding to 1.4542, UNS 17400 and ASTM A564M

TYPICAL APPLICATIONS

- Acid and corrosion resistant engineering parts
- Medical instruments (surgical tools, orthopedic instrumentation)

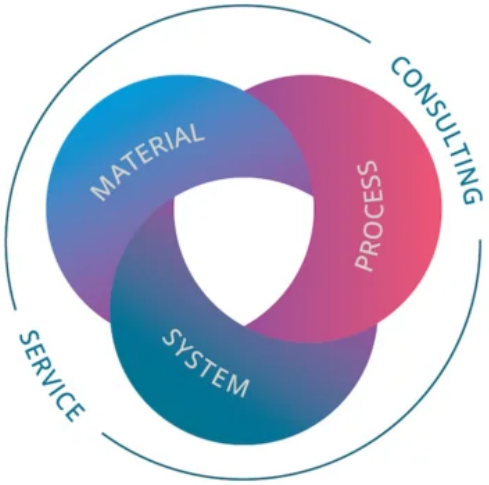
The EOS Quality Triangle

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

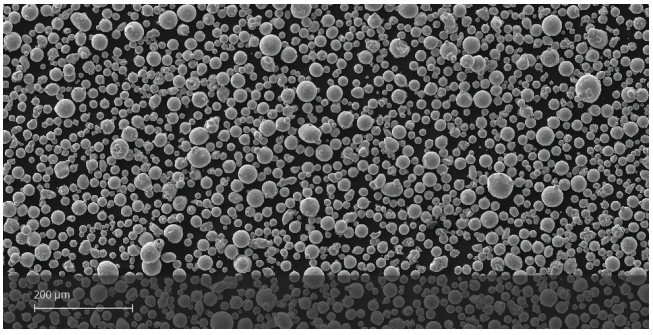


POWDER PROPERTIES

The chemical composition of parts is in compliance with standards “F899 – 12b Standard Specification for Wrought Stainless Steels for Surgical Instruments” and “A564M – 13 Standard Specification for Hot-Rolled and Cold-Finished AgeHardening Stainless Steel Bars and Shapes”. Composition complies the material composition in “powder properties” section. Part accuracy is adjustable by changing the “Beam Offset, X-, Y- and Z-Shrinkage”-parameters.

Powder Chemical Composition (wt.-%)

Element	Min.	Max.
Cr	15	17.5
Ni	3	5
Cu	3	5
Si	-	1
Mn	-	1
C	-	0.07
P	-	0.04
S	-	0.03
Nb + Ta	0.15	0.45



Powder Particle Size

GENERIC PARTICLE SIZE DISTRIBUTION	**15 - 65 µm**

HEAT TREATMENT

Description

Vacuum H900 & Atmospheric HT procedures

Steps

Vacuum H900 heat treatment procedure

Solution annealing: Hold at 1040°C (1904°F) ±15°C (± 59°F) for 30 minutes, air cooling under 32°C (89°F).

Ageing: Hold at 480°C (896°F) for one hour, air cooling under 32°C (89°F).

Atmospheric HT procedure (preferred atmosphere: Argon)

Solution annealing: Hold at 1040°C (1904°F) ±15°C (± 59°F) for 30 minutes, air cooling under 32°C (89°F).

Ageing: Hold at 460°C (860°F) for one hour, air cooling under 32°C (89°F).

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