

## Feedstock specifications

<b>Product description</b>	Metallic feedstock for the production of sintered components of 17-4 Precipitation Hardening Stainless Steel (ASTM A564, ASTM A693 and AMS 5622).
<b>Appearance</b>	Spoiled filament
<b>Density</b>	5.0 g/cm <sup>3</sup>
<b>Binder basis</b>	Solvent + thermal
<b>Powder chemical composition (wt.%)</b>	0.05C-0.69Si-0.19Mn-0.022P-0.003S-3.66Cu-3.92Ni-16.21Cr-0.08Mo-0.19Nb+Ta-Bal.Fe
<b>Particle shape</b>	Spherical
<b>Particle size</b>	d90-23.8 μm; d50-10.8 μm; d10-4.1 μm
<b>Powder production method</b>	Water atomized
<b>Powder specification</b>	UNS S17400
<b>Shrinkage (approx.)</b>	15.5 ± 0.5 %
<b>Mould factor (approx.)</b>	1.18
<b>Shelf life</b>	Product can be used for approx. 12 months after opening if stored dry at room temperature. Vessel has to be closed airtight thoroughly after feedstock withdrawal.

## Feedstock processing: Printing conditions

<b>Filament diameters (mm)</b>	1.75 ± 0.05 (suitable for direct drive & Bowden drive)
	2.85 ± 0.05 (suitable for direct & Bowden drive)
<b>Filament heater</b>	Not required
<b>Platform temperature (°C)</b>	60-80
<b>Nozzle temperature (°C)</b>	265
<b>Printing speed (mm/s)</b>	25-30
<b>Fan speed (%)</b>	100
<b>Layer thickness (mm)</b>	0.15 - 0.30 mm
<b>Flow rate (%)</b>	100
<b>Nozzle diameter</b>	Recommended ≥ 0.2 mm
<b>Border</b>	Recommended 2 strands



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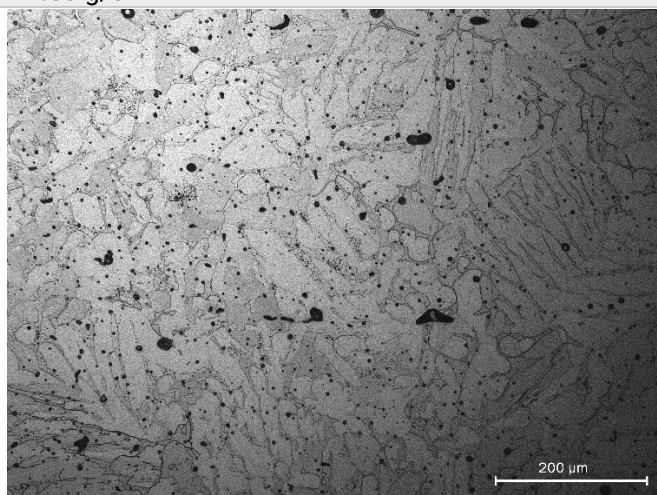
Feedstock processing: Debinding and sintering

<b>Debinding process</b>	Solvent (Cyclohexane, 65 °C, 6-8h) Thermal (N <sub>2</sub> atmosphere, T <sub>máx.</sub> 440 °C, 9 h)
<b>Thermal debinding cycle</b> Suggested for 5 mm thickness	10 °C/min – 100 °C – 10 min 1 °C/min – 350 °C – 1 h 1 °C/min – 430 °C – 1 h 1 °C/min – 440 °C – 1 h
<b>Weight loss (Solvent debinding)</b>	> 3 wt. %
<b>Total weight loss</b>	> 6 wt. %
<b>Sintering temperature</b>	T <sub>máx.</sub> 1380°C, vacuum, H <sub>2</sub>
<b>Sintering time</b>	1 h at maximum temperature
<b>Sintering substrate</b>	Non-metallic

Composition and properties as sintered

<b>Typical composition (wt.%)</b>	C: 0.065 ± 0.005
<b>Density</b>	≥ 7.53 g/cm <sup>3</sup>

**Microstructure**



<b>Hardness</b>	≥ 325 HV1
<b>Yield strength</b>	≥ 940 MPa
<b>Ultimate tensile strength</b>	≥ 1070 MPa
<b>Elongation</b>	≥ 8 %
<b>Ultimate flexural strength</b>	≥ 2100 MPa

All information in this document must be considered as a guide based on our current knowledge and experience. The data are regularly acquired according to the implemented quality assurance program. This information is not a guarantee of certain properties, the product specimens' characteristics, or the suitability for its application on a specific purpose. Further tests and trials by customer are not dismissed since a wide variability of factors have an influence on the processing and application of our products. The description displayed does not constitute the agreed contractual quality of the product and it may change without prior information. It is the processor's responsibility to ensure the proprietary rights and existing legislation are considered.



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