

# ADDITIVE MANUFACTURING POWDER

## W360 AMPO / FE-BASED ALLOYS

### Application Segments

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Additive Manufacturing Application

### Available Product Variants

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15 - 45 µm

45 - 90 µm

### Product Description

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The BÖHLER W360 AMPO is the powder equivalent of the W360 ISOBLOC. Due to its chemical composition, the material belongs to the product group of hot-work tool steels. After hardening and tempering, it can achieve a hardness of up to 57 HRC with very good toughness properties. Its high temperature wear resistance, heat resistance and toughness characterizes the material. Applications: Printed components with conformal cooling for die casting applications, wear protection layers and repair work in mold making using laser cladding.

### Process Melting

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VIGA

### Applications

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- > 3D Printing - direct metal deposition
- > Hot Extrusion
- > Gravity / Low Pressure Die-Casting
- > Powder for additive manufacturing
- > Cutting
- > BJT - Binder Jetting
- > 3D Printing - selective laser melting
- > Forging (Hot / Semi-hot)
- > Injection Moulding
- > Press Hardening / Hot Stamping
- > Grinding
- > MIM - Metal Injection Moulding
- > Forging Applications
- > High Pressure Die-Casting
- > Other Components
- > EBM Electron Beam Melting
- > Extrusion

### Technical data

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Material designation	
BÖHLER patent	Market grade

### Chemical composition (wt. %)

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C	Si	Mn	Cr	Mo	V
0.5	0.2	0.25	4.5	3	0.55

## Powder Properties

### Particle Size Distribution \*

Typical Values	D10	D50	D90
[ $\mu\text{m}$ ]	18-24	29-35	42-50

\* Measurement of particle size distribution according to ISO 13322-2 (Dynamic image analysis methods);

### Apparent density\*\*

min. 3.6 g/cm<sup>3</sup>

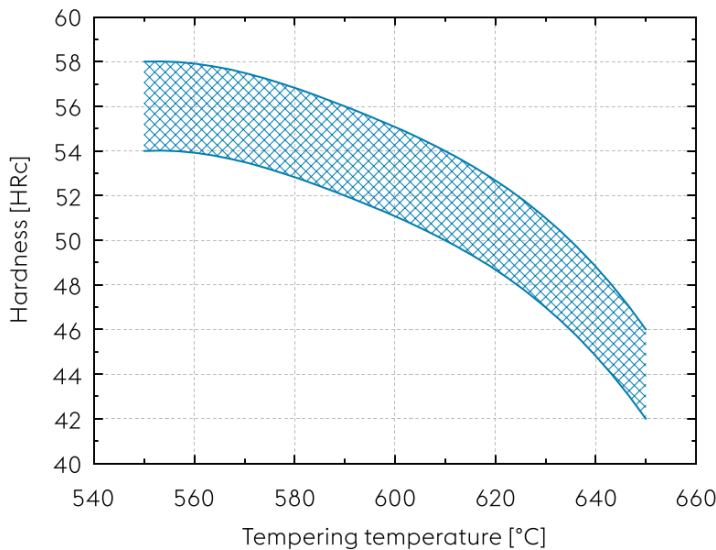
\*\* Measurement of apparent density is based on ASTM B964 resp. DIN EN ISO 3923-1 and relates to our typical measured values

## Mechanical Properties

### With according Heat Treatment

Tensile strength (Rm) (MPa)	1,970 to 2,010
Yield strength (RP <sub>0.2</sub> ) (MPa)	1,500 to 1,670
Elongation (%)	7 to 8
Hardness (HRc)	55 to 57
Impact Toughness (ISO-V) (J)	8 to 14

## Tempering chart



Stress relieving: 690°C in a neutral atmosphere  
After through-heating, soak for 1 to 2 hours  
Cool slowly in furnace

Hardening: 1050°C

Oil or vacuum furnace with gas quenching  
Holding time at hardening temperature after through-heating: 15 to 20 minutes  
Achievable hardness: see tempering chart

Tempering (according to tempering chart): at least twice. Heat slowly to tempering temperature immediately after hardening. Holding time at tempering temperature 1.5 hours per temper. A third temper is advantageous.

Achievable mechanical properties are strongly dependent on the printing process.

If other available product variants are listed in addition to long products, please note that these may differ in terms of melting process, technical data, delivery and surface condition as well as available product dimensions. For mandatory technical specifications, other requirements and dimensions, please contact our regional voestalpine BÖHLER sales companies. The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. Measurement data are laboratory values and can deviate from practical analyses. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.

### voestalpine BÖHLER Edelstahl GmbH & Co KG

Mariazeller Straße 25

8605 Kapfenberg, AT

T. +43/50304/20-0

E. info@bohler-edelstahl.at

https://www.voestalpine.com/bohler-edelstahl/de/