

# 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
- > Extrusion
- > Gravity / Low Pressure Die-Casting
- > Powder for additive manufacturing
- > 3D Printing - selective laser melting
- > Forging (Hot / Semi-hot)
- > Injection Molding
- > Press Hardening / Hot Stamping
- > Forging Applications
- > High Pressure Die-Casting
- > Other Components

### 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>

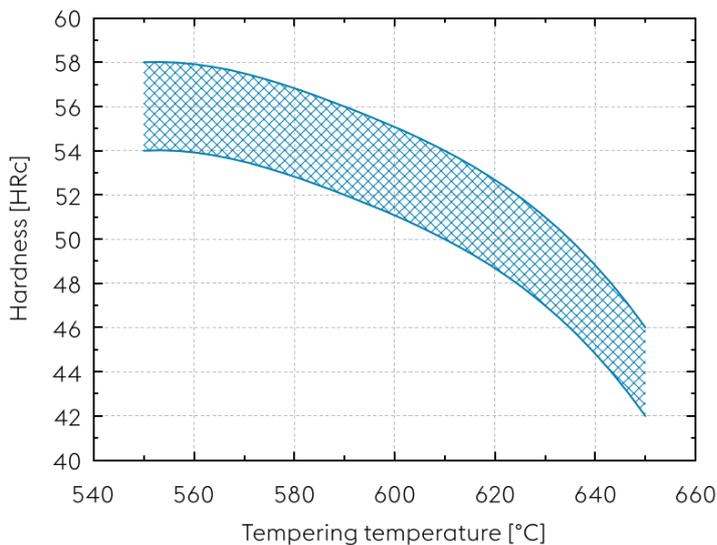
\*\* Measurement of apparent density is based on ASTM B964 resp. DIN EN ISO 3923-1 and relates to our typical measured values

## Mechanical Properties

### With according Heat Treatment

Tensile strength (Rm) (MPa   ksi)	1,970 to 2,010   286 to 292
Yield strength (RP <sub>0.2</sub> ) (MPa   ksi)	1,500 to 1,670   218 to 243
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.

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