BÖHLER

BÖHLER E185
AMPO

ADDITIVE MANUFACTURING POWDER

E185 AMPO / FE-BASED ALLOYS

Available Product Shapes

15 - 45 µm	45 - 90 µm

Product Description

The newly developed, patent pending, BÖHLER E185 AMPO is an AM powder, fulfilling the highest demands from various industries, ranging from motorsport to engineering components and any kind of prototype applications. This low alloyed steel with easy printability and the possibility for surface treatments (e.g. case hardening or nitriding) was developed especially for the demands of the 3D printing industry. The material shows an excellent combination of strength and toughness.

Properties

Particle size distribution 15 - 45 µm:

D10[µm]	18 - 24
D50[µm]	29 - 35
D90[µm]	42 - 50
Apparent density*	≥ 3.6 g/cm^3

Measurement of particle size distribution according to ISO 13322-2 (Dynamic image analysis methods);
* Measurement of apparent density is based on ASTM B964 resp. DIN EN ISO 3923-1 and relates to our typical measured values

Achievable mechanical properties in "as printed" condition:

Tensile strength	1170 ± 50 MPa
Yield strength	1050 ± 50 MPa
Elongation	15 ± 2 %
Hardness	37 ± 1 HRc
Impact toughness (Charpy V)	140 ± 10 J

Achievable mechanical properties in "as printed" and heat treated condition:

Tensile strength	1370 ± 50 MPa
Yield strength	1150 ± 70 MPa
Elongation	13 ± 1 %
Hardness	44 ± 1 HRc
Impact toughness (Charpy V)	85 ± 10 J

Case hardened:

Surface hardness	750 ± 20 HV30
Case hardening depth	0.8 - 0.9 mm

Particle size distribution 45 - 90 µm:
Details on request

Applications

- 3D Printing - direct metal deposition
- Automotive
- General Components for Mechanical Engineering
- 3D Printing - selective laser melting
- Automotive Racing
- Industry gear boxes
- Powder for additive manufacturing
- Civil and mechanical engineering
- Mechanical Engineering / Machine Building General

voestalpine BÖHLER Edelstahl GmbH & Co KG
www.voestalpine.com/bohler-edelstahl

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Applications

- Other Components
- Unknown Components Application
- Other Oil and Gas + CPI comps.
- Wind Power
- Tool Holders (milling, drilling, turning & chucks)

Material designation	
BÖHLER patent (pending)	Market grade

Chemical composition (wt. %)

C	Si	Mn	Cr	Mo	Ni	V
0.19	0.22	0.3	0.95	0.2	1.25	0.15

Powder Properties

Particle Size Distribution 15-45µm

Typical Values	D10	D50	D90
[µm]	18-24	29-35	42-50

Bulk Density*	>=4 g/cm^3

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

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

Mechanical Properties

As Printed

Tensile Strength	1,120 | 162,442 to 1,220 | 176,946 MPA | psi
Yield Strength	1,000 | 145,038 to 1,100 | 159,541 MPA | psi
Elongation	13 to 17 %
Hardness	36 to 38 HRc
Impact Toughness*	130 to 150 J

* Chapy-V samples at room temperature

With according Heat Treatment

Tensile Strength	1,320 | 191,450 to 1,420 | 205,954 MPA | psi
Yield Strength	1,080 | 156,641 to 1,220 | 176,946 MPA | psi
Elongation	12 to 14 %
Hardness	43 to 45 HRc
Impact Toughness	75 to 95 J

With according Heat Treatment and Case Hardening

Surface Hardness*	730 to 770 HRc
Case Hardening Depth	1 | 0 to 1 | 0 mm | inch

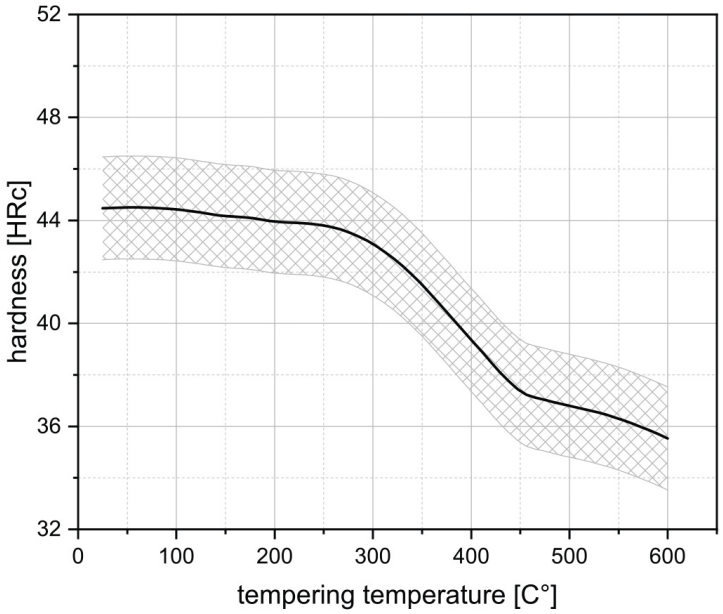
* HV 30

Heat treatment

Hardening and Tempering

Temperature (°C | °F)	850 | 1562	30 min.; Cool in water; Tempering: 200°C / 392 °F for 2 hours cool in air.

Hardening - Tempering Curve



Heat treatment
Hardening temperature 850°C
Soaking time 30 min
water quenched

Single tempering at mentioned temperatures for 2h / air cooling.
After each heat treatment step the material has to cool down until room temperature.

For more information see www.voestalpine.com/bohler-edelstahl

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