BÖHLER

BÖHLER AMPO

Additive Manufacturing Powder

ADDITIVE MANUFACTURING POWDER

A logical step for BÖHLER
one giant leap for the 3D printing industry.

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

voestalpine
ONE STEP AHEAD.

METALLURGICAL COMPETENCE SINCE 1870

BÖHLER AMPO
Additive Manufacturing Powder

As a technology leader and sustainable leading company in the relevant market segments of powder metallurgy, we offer our customers expertise in development, consulting and production at the highest customer-specific level for more than 25 years.

Our outstanding product quality, process stability and global logistics competence ensure market-leading delivery performance in all global target markets.

Therefore, it was a logical step to apply our know-how to the production of powder for additive manufacturing, thereby expanding our product portfolio for our customers. We use our comprehensive research and testing facilities for the development of customer-specific powder variants in order to redefine the performance limits for the most demanding components.

SUSTAINABILITY IN THE FOCUS OF OUR ACTIONS

As an innovation leader in the development and production of special steels, we have made sustainable production processes and responsible use of resources an inherent part of our corporate philosophy for decades. For powder production, we use various gases as process, shielding, and purging gases. The nitrogen we use is green nitrogen, produced exclusively using renewable energy sources. This allows for a reduction of up to 99% in CO_2 emissions during nitrogen production. Per kilogram of powder produced, this results in a saving of approximately 1 kg CO_2eq.

Upon request, we can provide our customers with LCA reports (Life Cycle Assessments), which detail the environmental impacts of our products throughout their entire life cycle.

SPECIAL STEEL AN ENVIRONMENTALLY FRIENDLY MATERIAL

Along with innovative solutions for a sustainable future, the raw materials used play a crucial role. Special steel is an indispensable material for our modern world because it is versatile, durable and environmentally friendly. No other material is recycled as effectively as special steel, in unlimited cycles and with no loss of quality. Around 80 percent of all steel ever produced worldwide is still in use today – this makes steel an ecological role model. BÖHLER AMPO products are manufactured using renewable electrical energy, are 100 percent recyclable and thus make an important contribution to the fight against climate change.

Our laboratory is certified under the NADCAP accreditation program in the three areas of Material Testing Laboratories, Non-Destructive Testing and Heat Treatment.

Other company certifications include EN 9100, EN ISO 14001, EN ISO 50001 and ISO 45001.

FOR ADDITIVE MANUFACTURING, WE OFFER OUR CUSTOMERS NINE POWDER TYPES UNDER THE BRAND NAME BÖHLER AMPO.

Own development* (patented)	
BÖHLER M789 AMPO	Co free
BÖHLER E185 AMPO	Co free
BÖHLER W360 AMPO	Co + Ni free

*free printing parameters on request

For more information

Standard Grades	
BÖHLER W722 AMPO	~ Maraging 300 / 1.2709
BÖHLER N700 AMPO	17-4PH / 1.4542
BÖHLER L625 AMPO	Alloy 625 (Inconel) / 2.4856
BÖHLER L718 AMPO	Alloy 718 (Inconel) / 2.4668
BÖHLER L718API AMPO	Alloy 718 (Inconel) / 2.4668
BÖHLER L175 AMPO	CoCr / 2.4979

Tailor-made

Fe, Ni or Co based

OUR CUSTOMERS BENEFIT FROM:

Product range. We offer an extensive standard range of currently 9 powder types from stock, whereby our product portfolio is constantly updated with innovative new developments. For customer-specific requirements, we can resort to our in-house portfolio of around 250 grades. Our production facilities and metallurgical expertise make it possible to customize alloys.

State of the art technology. Vacuum induction melting and atomization under inert gas ensure the highest product quality. The powder is manufactured using the latest atomization and processing technology and is then extensively tested in-house in our accredited powder laboratory.

Highest product quality. The integration into the steel mill enables the starting material for the atomization process to be individually tailored to the requirements of the respective alloy. Whether melted conventionally or under vacuum – the right process is available for every product. This ensures the highest quality standards and minimizes unwanted contamination.

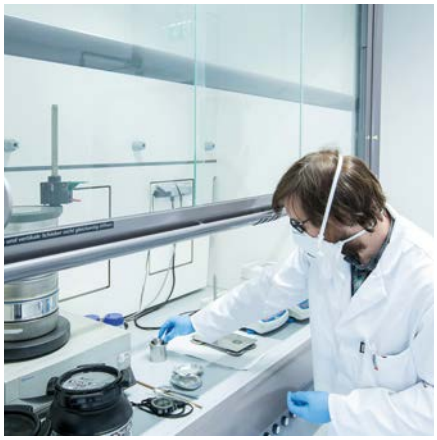
Particle size distribution. Depending on the requirements of the AM process used, we can provide suitable particle fractions.

Test laboratory / analyses. The modern testing laboratories at voestalpine BÖHLER Edelstahl supply our production with important information on product parameters for process control and product certification according to testing standards and customer specifications.

Worldwide sales network. By storing in the central warehouse in Kapfenberg and, if required, in the sales warehouses worldwide, we offer optimal availability through short delivery times combined with high delivery reliability.

In our test laboratory, we rely on qualified and carefully trained staff.

We pay close attention to cleanliness and proper testing to ensure the highest standard.



The use of up-to-date measuring technology and investment in new methods is important to us.

Our production facility enables flexible, customer-oriented powder production.

Vacuum induction melting and atomization under inert gas ensure the highest possible metallurgical purity of the powder.

BÖHLER AMPO TECHNICAL DATA

We offer powders with the right properties for every application and printing technology. In our global development and testing center we produce test objects with 3D printing in order to acquire experience and explore new application areas for additive manufacturing of components.

Fraction Size*	**D10** [µm]	**D90** [µm]
0 - 20 µm		10 – 20
15 - 45 µm	18 – 24	42 – 50
45 - 90 µm	40 – 50	80 – 100
Tailormade PSD on request		

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

Available packaging units:

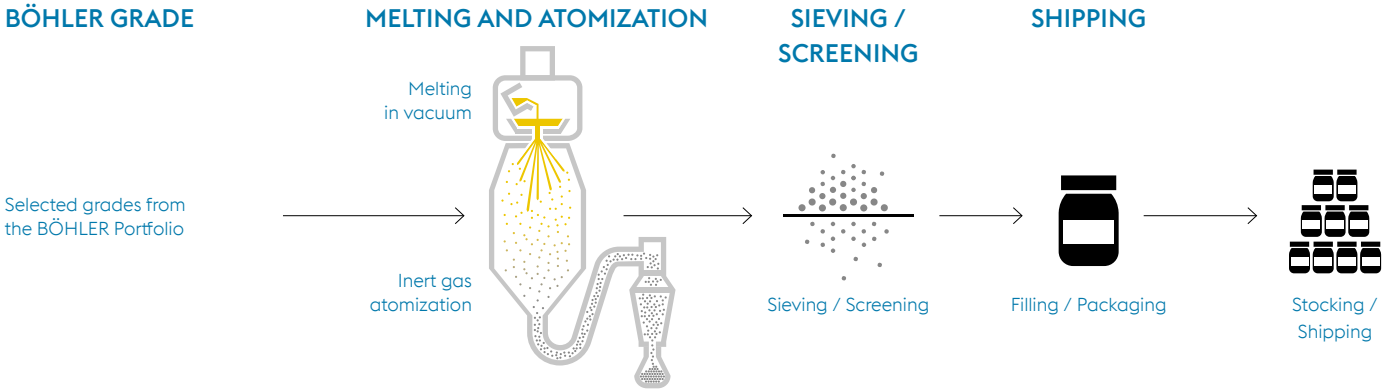
» 10 kg wide-neck drum
» 100 kg steel drum

Environmental friendliness is also a key focus when it comes to packaging. The standard packaging for our powder consists of up to 70% recycled plastic. Additionally, we offer our customers steel containers as an alternative packaging option.

We offer high quality powder in tool steel, corrosion resistant steel, cobalt and nickel based alloy. We optimize the material properties to enable maximum performance of the materials.

voestalpine BÖHLER Edelstahl GmbH & Co KG is not just a powder supplier. Thanks to the cooperation with our globally active research and test centers, the voestalpine Group also has in-depth knowledge of 3D printing and can therefore offer the customer a holistic solution from the concept drawing to the finished component.

MATERIAL FLOW BÖHLER AMPO POWDER FOR ADDITIVE MANUFACTURING



BÖHLER M789
AMPO

Chemical composition [wt. %]

Element	C	Cr	Mo	Ni	Ti	Al	
Mass - %	≤ 0.02	12.20	1.00	10.00	1.00	0.60	Co free*

BÖHLER E185
AMPO

Chemical composition [wt. %]

Element	C	Si	Mn	Cr	Ni	Mo	V	
Mass - %	0.19	0.22	0.30	0.95	1.25	0.20	0.15	Co free*

BÖHLER W360
AMPO

Chemical composition [wt. %]

Element	C	Si	Mn	Cr	Mo	V	
Mass - %	0.50	0.20	0.25	4.50	3.00	0.55	Co free* Ni free**

BÖHLER W722
AMPO

DIN 1.2709 / ~ Maraging 300

Chemical composition [wt. %]

Element	C	Si	Mn	P	S	Mo	Ni	Co	Ti
Mass - %	≤ 0.03	≤ 0.10	≤ 0.15	≤ 0.01	≤ 0.01	4.90	18.00	9.30	1.10

BÖHLER N700
AMPO

DIN 1.4542 / 17-4PH / UNS S17400 (chemistry of AMS 5643 respectively AMS 5622)

Chemical composition [wt. %]

Element	C	Cr	Ni	Cu	Nb
Mass - %	0.04	16.25	4.00	4.00	0.34

BÖHLER L625
AMPO

DIN 2.4856 / UNS N06625 (upon request chemistry according to AMS 5666, ASTM B 446, ASTM B 564 possible)

Chemical composition [wt. %]

Element	C	Cr	Mo	Ni	Co	Ti	Al	Nb	Fe
Mass - %	0.05	21.50	9.00	> 58.00	≤ 1.00	0.20	0.20	3.65	≤ 5.00

BÖHLER L718
AMPO

DIN 2.4668 / UNS N07718 (chemistry of AMS 5662 respectively AMS 5663 possible)

Chemical composition [wt. %]

Element	C	Cr	Mo	Ni	Ti	Al	Nb	B	Fe
Mass - %	0.04	19.00	3.05	52.50	0.90	0.50	5.13	0.004	Balance

BÖHLER L718API
AMPO

DIN 2.4668 / UNS N07718 (chemistry of API Std. 6ACRA)

Chemical composition [wt. %]

Element	C	Cr	Mo	Ni	Ti	Al	Nb	B	Fe
Mass - %	0.02	18.00	3.00	Balance	0.95	0.50	5.00	0.003	18.50

BÖHLER L175
AMPO

UNS R30075 (chemistry of ASTM F75)

Chemical composition [wt. %]

Element	C	Si	Mn	Cr	Mo	Ni	Co	Fe
Mass - %	≤ 0.35	≤ 1.00	≤ 1.00	28.50	6.00	≤ 0.50	64.00	≤ 0.75

Order quantity	10 kg minimum
Particle size distribution	Nominal 0 to 20 µm, 15 to 45 µm, 45 to 90 µm or customized after request

* Co-content ≤ 0.1%
** Ni-content ≤ 0.1%

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