# voestalpine HPM Hungary Kft.

## Coating Division

Luczai Norbert, Head of Heat-Treatment and Coating



voestalpine
ONE STEP AHEAD.

# voestalpine HPM Hungary Kft. – The company

The company voestalpine High Performance Metals Hungary Kft. operates in the following areas:

- Sale of Tool Steels
- Sale of High Speed Steels
- Sale of Welding consumables and Welding machines
- Machining
- Heat-Treatment
- Coating


voestalpine
ONE STEP AHEAD.

# voestalpine HPM Hungary Kft. - History

- 1896: the Böhler brothers open their first office in Budapest
- 1975: opening a new office in Budapest
- 1993: new office and warehouse in Budapest (250m2)
- 1999: the company moves to Dunaharaszti (1600 $m^2$)
- 2004: the Heat-Treatment Division starts its operation (vacuum-hardening)
- 2007: the Machining Division starts its operation
- 2018: the Coating Division starts its operation



voestalpine

ONE STEP AHEAD.

# Coating Division

Our PVD Coating Division started its operation in the spring of 2018, located within a new, modern 1.000 $m^2$ production hall at our Dunaharaszti site.

Our Coating service is done by the modernest Coating machines that have been developed and manifactured by our German sister company, voestalpine eifeler Vacotec GmbH, which has a decades-long history in the PVD coating business. Nevertheless, we can offer to our customers the coatings that have been developed and tested by voestalpine eifeler Vacotec GmbH.

Thanks to our state-of-the-art process control systems, we can provide up-to-date information on the readiness of the tools to be coated, the measurement results and machine batch protocols (temperature and technology diagrams) can be retrieved at any time, in accordance with ISO requirements.

Our factory is ISO 9001: 2015 certified.



voestalpine
ONE STEP AHEAD.

# Coating - Technology

In our Coating facility PVD-Coating is performed which creates a wear-resistant, typically 2-6 µm thick coating with extreme high hardness (depending on the type of coating) on the surface of the parts. The coating process is carried out in deep-vacuum and in plasma enviroment.

The coating

- encreases the life-time of the parts,
- decreases the coefficient of friction,
- prevents sticking during use,
- improves heat dissipation, and
- increases the corrosion resistance of parts.



voestalpine
ONE STEP AHEAD.

# Coating - Technology

The advantages of the technology:

- excellent adhesion can be ensured
- thanks to the large chamber large parts can be coated
- no dimensional change
- can be combined with nitriding (Duplex coatings)
- well reproducible technology, thanks to pre-saved programs

Disadvantages:

- not all material qualities can be coated (materials containing Zn, Mg, Cd cannot be coated)
- the materials to be coated must be electrically conductive
- the possibility of coating depends on the geometry of the part.

In case of questions our staff is at the disposal of our customers!

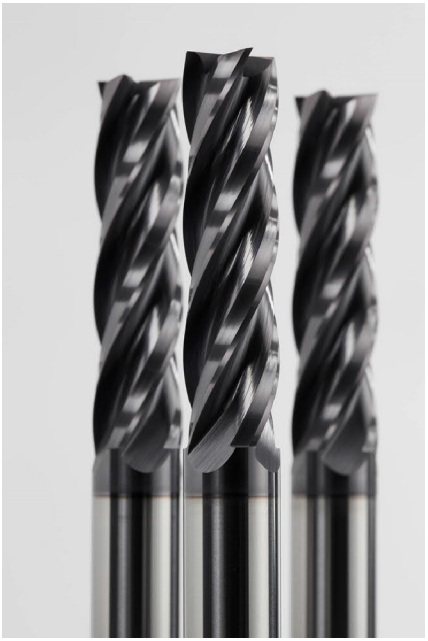


voestalpine
ONE STEP AHEAD.

# Coating - Coating types

All coating types developed by voestalpine eifeler Vacotec GmbH are available at our Dunaharaszti site:

- basic coatings, such as TiN, TiCN, CrN, CrCN, ZrN and ZrCN
- modern hard coatings, such as EXXTRAL®-plus and VARIANTIC
- nano-structured, high-performance coatings, such as TIGRAL, CROSAL®-plus and SISTRAL®
- all Duplex coatings (combined with nitriding), such as Duplex-VARIANTIC, Duplex-TIGRAL, Duplex- CROSAL®-plus and DUMATIC
- SPCS coatings: TiN-ultrafine, TiCN-ultrafine, EXXTRAL®-ultrafine and SISTRAL®-ultrafine
- low temperature (max. 300 ° C) coatings, such as TiN low temperature, CrN low temperature and Exxtral low temperature



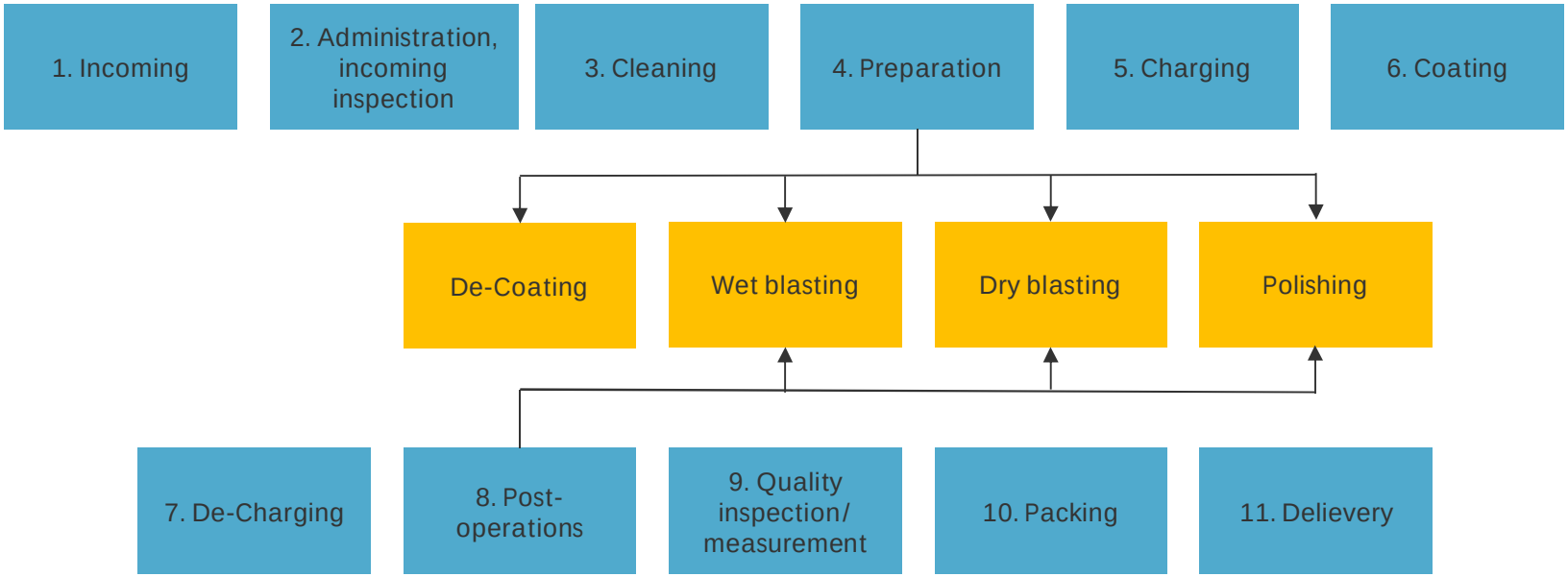
voestalpine
ONE STEP AHEAD.

# Coating - Areas of application

Our available coating types can be used in many sectors of the industry, including :

- Coatings for cold forming tools,
- Coatings for hot forming tools,
- Coatings for tools used in plastic injection molding,
- Coatings for forging tools,
- Coatings for die casting tools,
- Coatings for cutting tools (shank tools, hobs, inserts, etc.),
- Coatings meeting food industry requirements,
- Coatings that meet health requirements,
- Decorative coatings,
- etc.

# Coating – Process steps






voestalpine
ONE STEP AHEAD.

# Process steps – Cleaning

To ensure excellent adhesion of the coating, proper cleaning of the parts is a key factor which is carried out in a fully automated cleaning line at our facility.

The cleaning process takes place at machine-controlled temperatures and holding times in various alkaline solvents, followed by accurate drying - also within the washing line. The result of the cleaning is a completely clean - free of oil, grease, emulsion, etc. - and dry surface which is suitable for receiving PVD coating and provides excellent adhesion.



voestalpine
ONE STEP AHEAD.

# Process steps – De-Coating

In the case if PVD-coated parts arrive for re-coating, we have the opportunity to remove the old coating chemically.

In our coating facility, we can remove the coatings from the parts we have coated, in the case of both Ti- and Cr-based coatings, also from the surfaces of parts made of tool steel, HSS and CC.

If the parts were coated by another Coating Company, with a precise information of the type of coating, we can most likely remove the coating from the surface. In this question our staff is at the disposal of our customers!



voestalpine
ONE STEP AHEAD.

# Process steps – Wet blasting

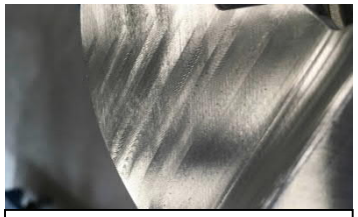
In a unique way in Hungary, our Coating facility has a wet blasting machine, with which we can both prepare the surface before coating and use it as a post-operation on the coated tools.

Preparation:

- for rounding cutting edges (shank cutting tools, hobs, etc.)
- to improve surface roughness, thus ensuring the max. Rz = 2 µm surface roughness for proper adhesion
- to homogenize the surface

Post-operation:

- to remove tiny “defects” of the coating, called droplets, thereby improving the properties of the part and increasing its life.



Before wet blasting

After wet blasting

voestalpine

ONE STEP AHEAD.

# Process steps – Dry blasting

Our factory has a dry blasting machine with which we can both prepare the surface before coating and use it as a post-operation on the coated tools.

<u>Preparation:</u>

- to remove burr from cutting tools
- to remove oxide layer (after EDM, nitriding, etc.)
- to remove corrosion

<u>Post-operation:</u>

- to remove tiny “defects” of the coating, called droplets, thereby improving the properties of the part and increasing its life.



voestalpine
ONE STEP AHEAD.

# Process steps – Polishing

Preparation of a polished surface that meets drawing specifications is key factor for the function and the life-time of parts.

Accordingly, our Coating facility undertakes the polishing of parts, which is carried out with the help of an external partner who has more than 20 years experience in polishing and in tool manufacturing / tool maintenance.



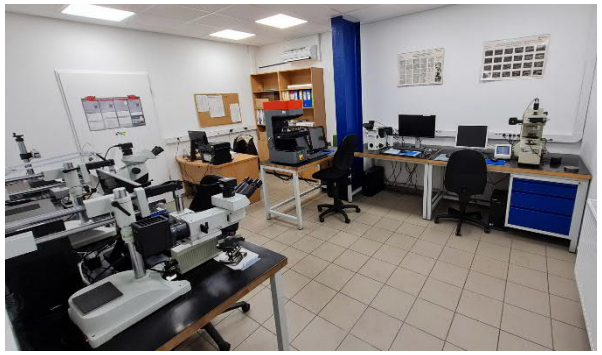
voestalpine
ONE STEP AHEAD.

# Process steps – Quality inspection / measurement

Each batch is validated after coating – according to ISO standards. The measured results are also indicated on the Delivery note of the finished parts and are archived in our system.

Accordingly, we measure

- layer-thickness (Calo-test),
- adhesion and
- surface roughness (optional, only on individual request!) of the coating.



Layer-thickness measurement

voestalpine
ONE STEP AHEAD.

# Contact


Luczai, Norbert – Head of Division
T +36 24 526 554
M +36 30 488 21 60
norbert.luczai@voestalpine.com

Kovács, Zoltán – Sales, technical support
M +36 30 743 22 06
zoltan.kovacs@voestalpine.com

Szabadi, Zsuzsa – Customer Service, quotations, invoicing
T +36 24 526 545
M +36 30 833 54 70
zsuzsa.szabadi@voestalpine.com

Varga, Nikolett – Quality Assurance
T +36 24 526 573
M +36 30 380 75 47
nikolett. varga@voestalpine.com

Simcsák, Attila – Production Manager
T +36 24 526 557
M +36 30 590 26 18
attila.simcsak@voestalpine.com




voestalpine
ONE STEP AHEAD.