

HOLISTIC DIE APPROACH



WE DON'T FOLLOW
EXCELLENCE -
WE LEAD IT

DEAR BUSINESS PARTNER,

For more than 350 years, we have been shaping the future of tool steel manufacturing for Die Casting - today serving customers in over 60 countries. Powered by our leading brands Böhler, Uddeholm, and Villares, we have always been committed to excellence.

Now, we have taken one step ahead: transforming from a trusted supplier of high-quality steels into **YOUR Technology Partner**, delivering not only premium materials, but a full package of solutions through a one-stop-shop strategy.

With our **Holistic Die Approach**, we deliver tailored, application-driven solutions across the entire Die Casting value chain:

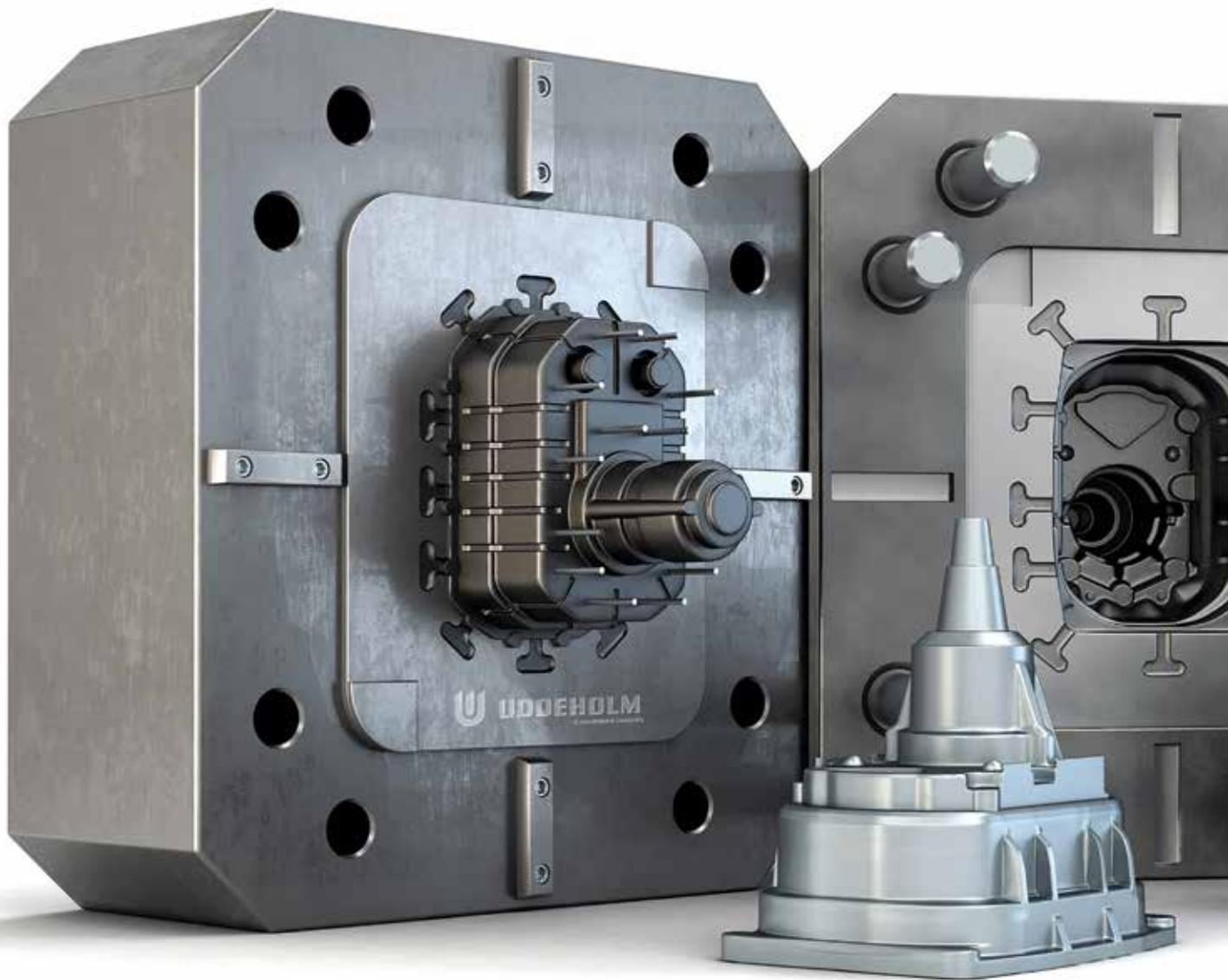
- » State-of-the-art supply, technical support, and services for **Die Makers**
- » Enhanced performance and efficiency (OEE) for **Foundries**
- » Reduced total cost of ownership (TCO) for **OEMs**

We are ready to take on your Casting Challenges and create sustainable, long-term value together.

Günther Prunner
Segment Manager Die Casting

HOLISTIC DIE APPROACH

WE UNDERSTAND
YOUR PROCESS
AND YOUR PRESSURE



READY FOR YOUR CASTING CHALLENGES

At voestalpine High Performance Metals, Die Casting is one of our core areas of expertise, supported by a dedicated global team. This positions us close to the Die Casting industry, with a deep understanding of individual needs. We achieve this by combining specialized materials and tailored services.

Our Holistic Die Approach offers everything you need to maximize OEE Improvement & Die Life – tailored to your process.

From material selection to treatments, from critical components to application support, we cover the entire die lifecycle—turning know-how into measurable performance:

» LESS SCRAP RATE

» MAINTENANCE OPTIMIZATION

» IMPROVE CYCLE TIMES

» LESS DOWNTIME

Our goal: putting your casting challenges at the center and turning them into a competitive advantage.



FROM MATERIAL SELECTION
TO TECHNICAL SUPPORT,
WE OFFER TAILORED SOLUTIONS
FOR EVERY NEED.

Discover our products
and services!

OUR TOP PRODUCTS



For decades, voestalpine and its core steel brands **BÖHLER**, **UDDEHOLM** and **Villares Metals** have set the benchmark in manufacturing and supplying high-performance tool steels. This experience gives us a deep understanding of the unique challenges faced by the High Pressure Die Casting industry. Our advanced steel mills and deep metallurgical know-how ensure materials with exceptional purity, toughness, and thermal resistance. Each grade is designed to perform under the extreme conditions of HPDC.



voestalpine SOLUTION	MATERIAL CODE	
Uddeholm Dievar	NADCA Grade C, Type C1850	Patent Grade
BÖHLER W403 VMR	NADCA Grade C, Type C1885	~ 1.2367
Villares Tenax300IM	NADCA Grade E, Type E1850	~1.2340 / H11 Modified Superior
BÖHLER W350 ISOBLOC	NADCA Grade E, Type E1850	Patent Grade
Uddeholm Vidar Superior	NADCA Grade E, Type E1825	~1.2340 / H11 Modified Superior
BÖHLER W360 ISOBLOC ®		voestalpine Exclusive Development
BÖHLER W300 ISOBLOC	NADCA Grade D, Type D1830	1.2343
BÖHLER W400 VMR	NADCA Grade E, Type E1810	1.2340
Uddeholm Orvar Supreme	NADCA Grade B, Superior ESR AISI H13 (No Type)	1.2344
BÖHLER W302 ISOBLOC	NADCA Grade B, Type B1885	1.2344
Villares VH13IM	NADCA Grade B, ESR AISI H13 (No Type)	1.2344
Uddeholm Unimax		Patent Grade
Uddeholm QRO90 Supreme		voestalpine Exclusive Development

OPTIMIZED POWDER FOR AM

PREMIUM MATERIALS
FOR MAXIMUM
PERFORMANCE

BÖHLER W360 AMPO*

-
- » Designed for high-temperature environments, **BÖHLER W360 AMPO** offers **superior hot wear resistance**, **high temper back resistance**, and **exceptional toughness**.

 - » **Outperforms conventional tool steels** such as 1.2343, 1.2344, and 1.2709 in thermo-chemical resistance and crack resistance, extending tool life significantly.

 - » Recommended hardness: **50–57 HRC**, ensuring durability under severe thermal and mechanical loads.

* Patent Grade

Uddeholm Dievar®

-
- » A chromium-molybdenum-vanadium alloyed hot work tool steel delivering **excellent resistance to heat checking**, **gross cracking**, and **plastic deformation**

 - » Offers superior toughness and high-temperature strength, **outperforming existing standards** such as 1.2343, 1.2344, and 1.2709

 - » Recommended hardness: **46–50 HRC**, ensuring a perfect balance between strength and ductility
-



Both grades are produced under strict quality control and paired with our proprietary AM parameters to guarantee **99.9% relative density, optimized microstructure, and consistent mechanical properties.**

With our advanced AM powders, you gain exceptional thermal resistance and toughness—keeping your dies in production longer, accelerating cycle times, and ensuring consistent performance even under the toughest HPDC conditions.

[FOR FULL DETAILS
CONTACT OUR
SPECIALISTS](#)

HEAT TREATMENT

EXTENDING
TOOL LIFE,
ENHANCING
PERFORMANCE



The secret to longer tool life isn't just in the steel—it's also in the heat treatment.

By applying the right process with absolute precision,
we unlock the full potential of your HPDC tools,
ensuring they withstand extreme thermal and mechanical loads shot after shot.



OUR HEAT TREATMENT SERVICES ARE DESIGNED TO:

- » Increase material strength while achieving optimal toughness
- » Improve wear resistance and minimize heat checking
- » Enhance corrosion behavior for longer tool life

OUR CAPABILITIES INCLUDE:

- » **Vacuum Hardening**
 - » ensures dimensional stability and clean surfaces; toughness, vacuum hardening according to NADCA specs.
- » **Gas and Plasma Nitriding**
 - » improves surface hardness and fatigue resistance
 - » optimized process for HPDC
- » **Additional Services**
 - » oxidizing, case hardening, laser hardening, sub-zero treatment, and more

Every process is tailored to your application and monitored by our expert metallurgists to guarantee consistent quality and performance.



SURFACE TREATMENTS PVD COATING

THE SHIELD BEHIND
DIE CASTING
PERFORMANCE

In High-Pressure aluminum Die Casting, surface degradation is inevitable—but not uncontrollable.

PVD coatings have become essential in extending tool life, reducing downtime, and maintaining dimensional accuracy under extreme thermal and mechanical stress.

By forming a protective barrier against soldering, erosion, and alloying reactions, advanced coatings help manufacturers achieve consistent part quality and operational efficiency.



INTRODUCING DUPLEX-TIGRAL® – DEVELOPED FOR DIE CASTING, ENGINEERED FOR EXTREMES

- » At the forefront of this innovation is **Duplex-TIGRAL®**, a premium PVD solution engineered by voestalpine eifeler for the most demanding die casting environments. Its two-stage process begins with **plasma nitriding**, which diffuses nitrogen into the steel surface to enhance hardness and adhesion. This is followed by a **AlCrTiN**- based layer, forming a dense, nanostructured matrix with exceptional resistance to oxidation, abrasion, and thermal shock.

SYNERGISTIC PROTECTION FOR MAXIMUM PERFORMANCE

- » Together, these layers create a synergistic defense against the harsh conditions of aluminum die casting. The **low application temperature (<450 °C)** preserves the base steel's integrity, while the coating's ductility and **high hot hardness (3300 HV)** ensure durability under cyclic stress. Duplex-TIGRAL® minimizes part sticking, reduces maintenance cycles, and enables multiple recoating rounds—delivering longer tool life, improved productivity, and superior casting performance.



IT'S NOT JUST PROTECTION—
IT IS PRECISION ENGINEERED FOR PRESSURE.

Visit us for more information about our PVD coatings and tailor-made solutions.

OUR SERVICES

OPTIMIZED COMPONENTS FOR DIE CASTING

TAILOR-MADE
SOLUTIONS



YOUR CHALLENGES, OUR TAILORED ANSWERS

To meet these challenges head-on, delivering ready-to-use solutions that combine premium voestalpine materials with advanced manufacturing technologies.

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- » **Premium Materials** – produced from high-performance BÖHLER and Uddeholm tool steels or AM powders for hot work applications.

 - » **Complete Processing** – each component undergoes state-of-the-art machining, voestalpine heat treatment, ABP surface treatment, and eifeler PVD coating for maximum durability.

 - » **Additive Manufacturing Advantage** – where needed, we integrate AM technology to create conformal cooling channels and customized sensor integration, reducing cycle times and improving part quality.
-



By choosing our optimized components, you combine premium materials, advanced treatments, and additive features like conformal cooling—helping you extend die life, reduce scrap and downtime, and optimize OEE for faster cycles and superior productivity.

FOR MORE INFORMATION
ABOUT OUR ENGINEERED PRODUCTS
AND TAILOR-MADE SOLUTIONS FOR HPDC
PLEASE CONTACT OUR TEAM



RESTORE COMPLEX HPDC DIES

TOOL REPAIR BY LASER METAL DEPOSITION

In High Pressure Die Casting, worn dies often mean costly downtime and full replacements. Our **Laser Metal Deposition (LMD)** service offers a smarter alternative — restoring critical areas with precision and durability.

WHAT MAKES THE DIFFERENCE

» **Targeted Restoration**

rebuild critical zones such as gates, ejector pin holes and worn areas without scrapping the entire die.

» **Dimensional Accuracy**

low heat input minimizes distortion compared to conventional welding.

» **Material Upgrade**

apply wear- or corrosion-resistant alloys exactly where needed for extended performance.

LMD uses a high-energy laser to melt metal powder directly onto the worn surface, rebuilding geometry layer by layer.

SMART DESIGN BY
PBF HIGH EFFICIENCY
COOLING FOR HPDC

POWDER BED FUSION



Powder Bed Fusion (PBF) technology unlocks new possibilities for High Pressure Die Casting.

By building components layer by layer from premium metal powders, we create complex geometries and near-contour cooling channels that conventional machining cannot achieve.

WHAT MAKES THE DIFFERENCE

- » **Optimized Thermal Management**
conformal cooling reduces cycle times and improves part quality
- » **Complexity Without Compromise**
freedom to design intricate shapes and integrate sensors
for smarter tooling
- » **Material Excellence**
BÖHLER and Uddeholm powders
engineered for HPDC
deliver superior hot wear resistance
and toughness



SUSTAINABILITY AND CIRCULAR ECONOMY



inSPire is our sustainability framework, built for real impact. It's driven by a dedicated team focused on practical projects that make a difference—helping our customers and our industry move toward a more sustainable future, one step at a time.

CLOSED LOOP: CIRCULAR ECONOMY IN ACTION*

In a circular economy, steel is endlessly recyclable—preserving its value, reducing environmental impact, and supporting sustainable growth.

At voestalpine High Performance Metals, we work closely with our customers and partners across the supply chain to retain valuable alloys and reintroduce them into the production of the same high-grade steel—without any loss in quality, while continuously improving our environmental footprint.

We take back your worn-out dies and recycle them through our secure closed-loop process. You gain space, avoid disposal challenges, and actively support sustainability – knowing your dies are transformed into new, high-performing steel with full protection of your know-how and materials.

* Check with our specialists for the possibilities in your country.



MAXIMIZING RECYCLING, SECURING SUPPLY

We're serious about reducing our primary raw material footprint. Already, 81% of input material in our melt shops is recycled.

Our goal: to use over 90% of scrap and secondary raw materials by 2030.



KEY BENEFITS

- » **Preservation of valuable alloys to reduce the environmental impact**
- » **Secure and Sustainable Supply**
- » **Protection of Intellectual Property**
- » **Fair and Transparent Compensation**

LET'S FUTURE-PROOF OUR INDUSTRY TOGETHER—
BY RECYCLING SMARTER, SECURING ESSENTIAL MATERIALS,
AND BUILDING A RESILIENT STEEL SUPPLY CHAIN THAT LASTS.



Learn more



THE voestalpine GROUP GLOBAL PRESENCE



- » 500 locations
- » 50 countries
- » 5 continents
- » Headquarters in Linz, AT



This map exclusively represents the HPM Division of the voestalpine Group.

voestalpine is a leading global steel and technology group

that offers combined material and processing expertise.

With its premium products and system solutions, voestalpine is a leading partner to the automotive and consumer goods industries, as well as to the aerospace and energy industries. The group is also the global market leader in railway systems, tool steel, and special profiles.

voestalpine is committed to the global climate goals and has a clear plan for the transformation of steel production with its greentec steel program.

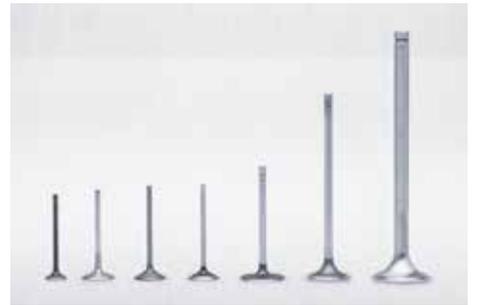
WE ARE YOUR RELIABLE PARTNER FOR INNOVATIVE END-TO-END MANUFACTURING SOLUTIONS



TOOL AND HIGH-SPEED STEEL



SPECIALTY METALS



VALVE AND SPECIAL ENGINEERING STEEL



POWDER FOR ADDITIVE MANUFACTURING



ADDITIVE MANUFACTURING

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. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.

In the High Performance Metals Division of the voestalpine group, we provide a comprehensive range of solutions across the entire value chain. From the supply of premium steel and metal powders for Additive Manufacturing, to advanced AM production, precision machining, heat treatment, and surface coating — we deliver finished, ready-to-install components tailored to your needs. Our expertise spans from material development to final product delivery, ensuring reduced waste, minimized risk, and optimized performance.



SAWING



MACHINING



HEAT TREATMENT



COATING AND TEXTURING



ENGINEERED PRODUCTS
Finished ready-to-install components

OPTIMUM DELIVERY
LOGISTICS GUARANTEE
FAST DELIVERY
TO OUR CUSTOMERS

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voestalpine

ONE STEP AHEAD.