



EDRO

PRODUCTS AND SERVICES FOR PLASTICS TOOLING

INNOVATIVE SOLUTIONS FOR HIGH PERFORMANCE
PLASTIC TOOLING APPLICATIONS

MATERIALS | MOLD BASES | PVD COATINGS | ADDITIVE

OUR PRODUCTS

RoyAlloy
STAINLESS

BÖHLER
TOOL STEELS

MOLDMAX
MOLD ALLOYS



PLASTIC MOLD STEELS

Our plastic mold steels have been designed, developed and refined specifically to provide the optimum solution for the most demanding applications in today's expanding plastics tooling market.

- + Injection Molding
- + PVC Extrusion
- + Blow molding
- + Rubber and LSR molding

ALUMINUM PLATE PRODUCTS

Our aluminum product line has been carefully selected to service a wide range of manufacturing requirements. We offer grades that can service the following applications:

- + Injection and Blow Molds
- + Thermoforming
- + Prototype Molds
- + Structural Foam Molds



COPPER ALLOYS

All MoldMAX products are high performance copper alloys designed for the plastic processing industry. These copper alloys offer a unique combination of thermal conductivity and strength that provides significant advantages for the molding process.

ADDITIVE MANUFACTURING POWDERS

EDRO distributes a wide range of BÖHLER metal powders trade named AMPO™ for additive manufacturing in both small and large particle sizes. A logical step for BÖHLER and one giant leap for the Metal 3D printing industry.



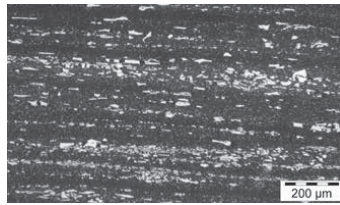
PREMIUM TOOL STEEL PRODUCTION

AIR MELTED TOOL STEELS



Air Melted Production

Produced with high cleanliness and homogeneity using the Electric Arc melting process.



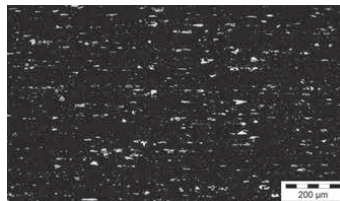
Micro structure of conventional 12% chromium steel

REMELTED TOOL STEELS



ESR / PESR Manufacture

Produced using Electro Slag Refining (ESR) and Pressure Electro Slag Refining (PESR) for steels requiring high level of cleanliness, toughness, and uniformity.



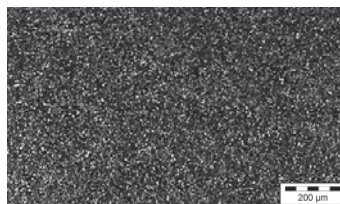
Microstructure of 8% chromium steel in ESR grade

P.M. (POWDER METALLURGICAL) STEELS

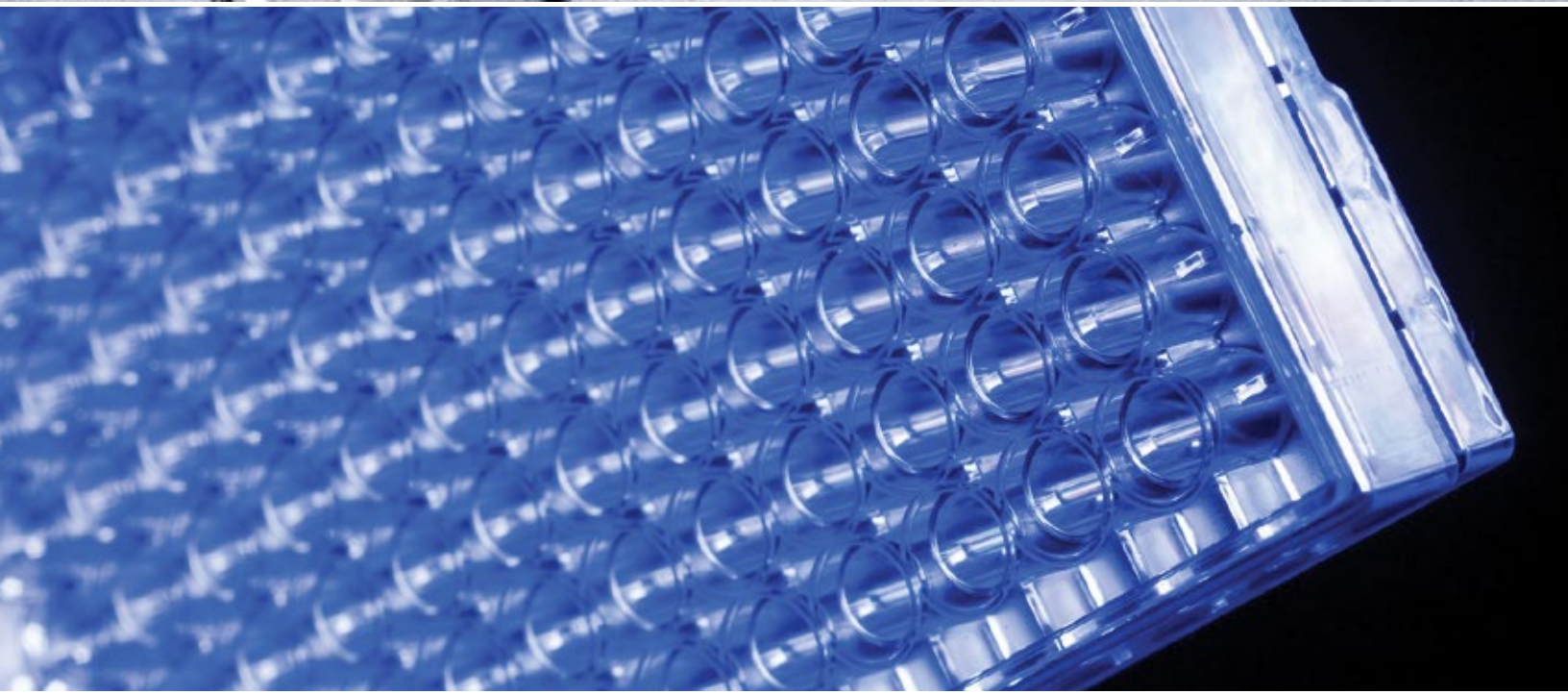
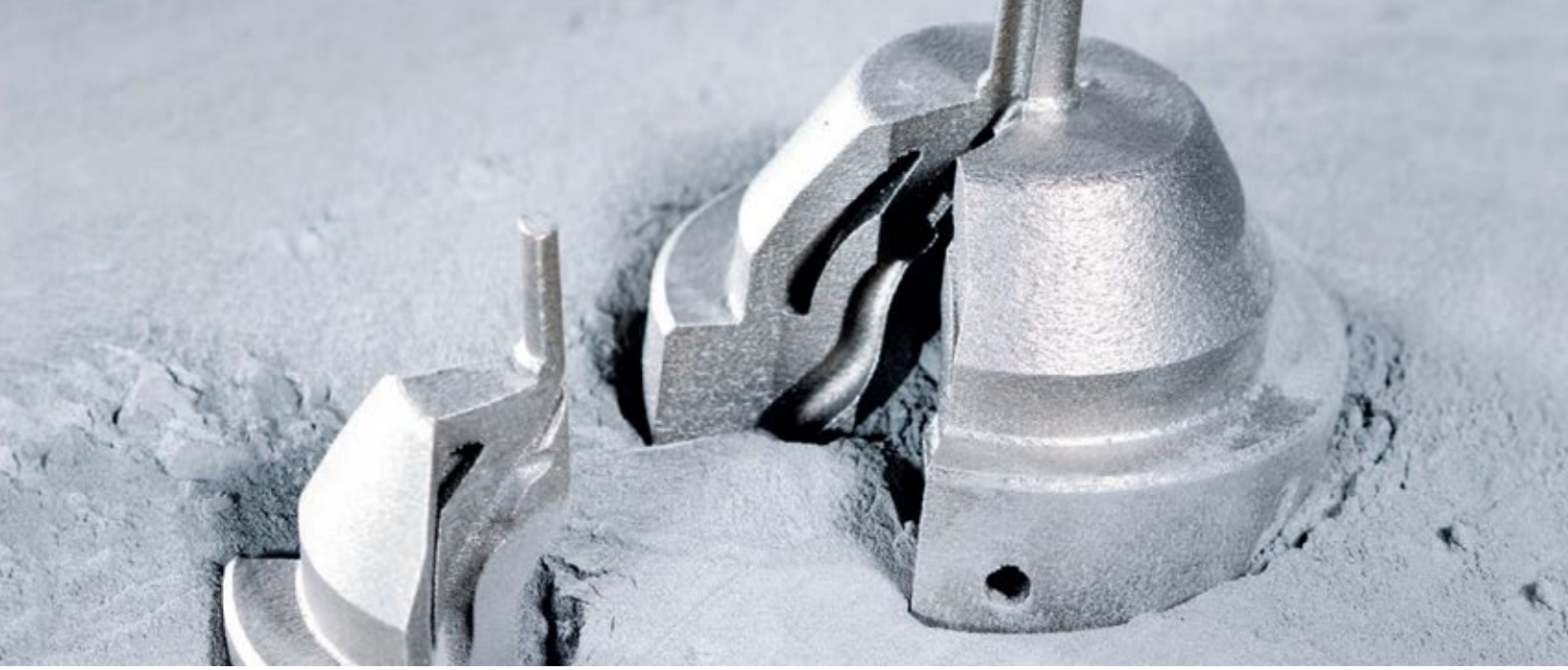


Powder Metallurgical Production

Produced using Powder Metallurgy Process for high alloyed steels requiring optimum homogeneity, hardness, micro-structure, and toughness.



Microstructure of PM materials



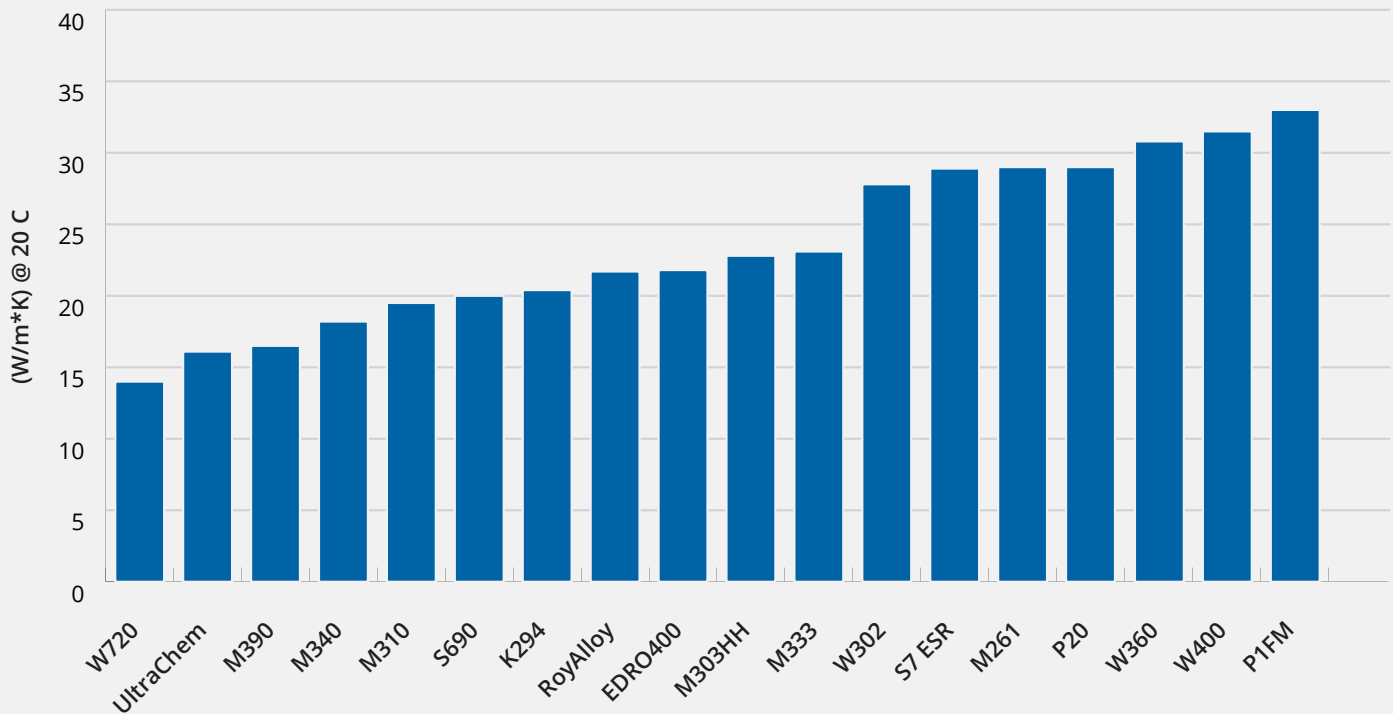
	AISI/DIN Equivalent	Delivered Condition (Approx.)	Achievable Hardness HRC	Thermal Conductivity W/m*K	Corrosion Resistance	Wear Resistance	Toughness	Polishability
STAINLESS STEELS								
BÖHLER M310 ISOPLAST®	420SS ESR 1.2083	HB225	48-52	19.5	★★★★☆	★★★★☆	★★★★☆	★★★★☆
BÖHLER M333 ISOPLAST®	Modified 420 PESR	HB220	48-50	23.1	★★★★★	★★★★☆	★★★★★	★★★★★
BÖHLER M340 ISOPLAST®	440B ESR 1.4112	HB260	53-58	18.2	★★★★☆	★★★★☆	★★★★☆	★★★★☆
BÖHLER M390 MICROCLEAN®	Special PM	HB280	56-62	16.5	★★★★☆	★★★★★	★★★★☆	★★★★☆
PREHARDENED STAINLESS STEELS								
RoyAlloy®	Modified 400 Series 1.2095	HRC 29-34	29-34	21.7	★★★★☆	★★★★☆	★★★★☆	★★★★☆
EDRO400®	Modified 400 Series	HRC 38-42	38-42	21.8	★★★★☆	★★★★☆	★★★★★	★★★★★
UltraChem®	Modified 15-5PH	HRC 38-42	38-42	16.1	★★★★★	★★★★☆	★★★★☆	★★★★★
BÖHLER M303	Modified 420 Series 1.2316	HRC 36-40	36-40	22.8	★★★★☆	★★★★☆	★★★★☆	★★★★★
NON STAINLESS STEELS								
BÖHLER K320	S7 ESR 1.2355	HB200	52-58	28.9	N/A	★★★★☆	★★★★☆	★★★★★
BÖHLER W302 ISOBLOC®	H13 ESR 1.2344	HB205	46-51	27.8	N/A	★★★★☆	★★★★☆	★★★★☆
BÖHLER W360 ISOBLOC®	Special Hot Work Grade	HB205	50-56	30.8	N/A	★★★★★	★★★★☆	★★★★☆
BÖHLER W720 VMR®	Marage 300 1.2709	HB290	51-58	14.0	N/A	★★★★☆	★★★★☆	★★★★☆
BÖHLER W400 VMR®	Modified H11 VMR 1.2367	HB205	53-54	31.5	N/A	★★★★☆	★★★★★	★★★★★
BÖHLER K294 MICROCLEAN®	PM-A11	HB280	63-65	20.4	N/A	★★★★★	★★★★☆	★★★★☆
BÖHLER S690 MICROCLEAN®	PM-M4 1.3351	HB280	64-66	20.0	N/A	★★★★☆	★★★★★	★★★★☆
PREHARDENED NON STAINLESS STEELS								
BÖHLER M261	Special (PH)	HRC 38-42	38-42	29.0	N/A	★★★★☆	★★★★☆	★★★★☆
P1-FM™	Modified 4130	HRC 28-32	28-32	33	N/A	★★★★☆	★★★★☆	★★★★☆
P20	P20 1.2738	HRC 30	30	29	N/A	★★★★☆	★★★★☆	★★★★☆

Machinability	Typical Applications for Injection Molds								Chemical Composition in % (Typical)					
	MoldBase Plate	Cavity /Core	Gate Insert	Stripper	Sleeve	Core Pin	Slide Body	Slide Face	C	Cr	Mo	Ni	V	Others
★★★★☆	X	X	X	X		X		X	0.38	14.30	-	-	0.20	-
★★★★☆		X	X	X		X		X	0.28	13.50	-	-	-	+N
★★★★☆		X		X	X	X		X	0.54	17.30	1.10	-	0.10	+N
★★★☆☆		X	X	X	X	X		X	1.90	20.00	1.00	-	4.00	W = 0.60
★★★★★	X	X							0.05	12.30	-	0.25		Cu=0.54 S=0.1
★★★☆☆	X	X		X	X				0.05	12.30	-	0.25	-	Cu=0.54
★★★★☆	X	X		X	X				0.04	14.75	-	4.5	-	-
★★★★☆	X	X					X	X	0.27	14.50	1.00	0.85	-	+N
★★★★☆		X		X	X	X	X	X	0.5	3.25	-	-	0.05	-
★★★★☆		X	X	X	X	X	X	X	0.39	5.20	1.40	-	0.95	Si=1.10
★★★★☆		X	X	X	X	X	X	X	0.50	4.50	3.00	-	0.55	Si=0.20
★★★★☆		X				X			C Max. 0.005	-	5.00	18.50	-	Co=9 Ti=.70
★★★★☆		X				X		X	0.36	5.00	1.30	-	0.45	-
★★★☆☆		X		X		X			2.45	5.20	1.30	-	V 9.7	-
★★★☆☆					X	X			1.35	4.10	5.00	-	4.10	W=5.90
★★★★☆	X	X					X		0.13	0.35	-	3.50	-	Mn=2.00 S=.15 Cu=1.20 Al=1.20
★★★★★	X			X					0.28	2.00				S=0.03
★★★★☆	X	X		X					0.38	2.00		1.10		

	Delivered Condition (Approx.)	Corrosion Resistance	Wear Resistance	Toughness	Polishability	Machinability	Thermal Conductivity W/m*K
COPPER ALLOYS							
MOLDMAX HH®	HRC 40	★★★★☆	★★★★☆	★★★☆☆	★★★★☆	★★★★☆	130.0
MOLDMAX LH®	HRC 30	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆	155.6
PROTHERM®	HRC 20	★★★★☆	★★★☆☆	★★★★★	★★★★☆	★★★★☆	250.8
MOLDMAX XL®	HRC 30	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★★	69.2
MOLDMAX V®	HRC 28	★★★★☆	★★★★☆	★★★☆☆	★★★★☆	★★★★☆	159.1

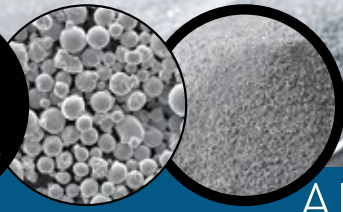
ALUMINUM PLATE							
ACP 5080P	HB 73	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	109
ACP 5080R	HB 73	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	109
6061-T651	HB 95	★★★★☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	152
7075-T651	HB 150	★★★★★	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	130
QC-10	HB 160	★★★★☆	★★★☆☆	★★★★☆	★★★★☆	★★★★☆	159

THERMAL CONDUCTIVITY - SPECIALTY STEELS



**BÖHLER
AMPO**

Additive
Manufacturing
Powder



BÖHLER

ADDITIVE MANUFACTURING POWDERS

**BÖHLER M789
AMPO**

Patent pending

Chemical Composition [average %]

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

**BÖHLER W360
AMPO**

Patent pending

Chemical Composition [average %]

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

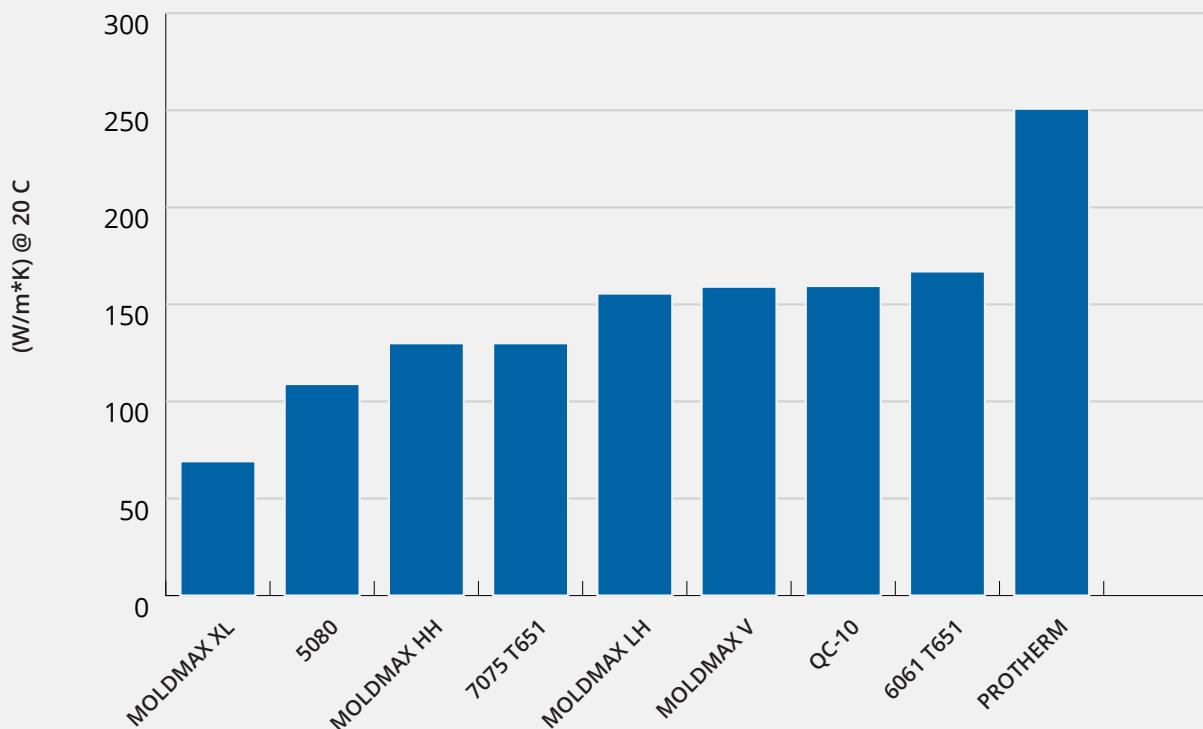
**BÖHLER W722
AMPO**

Chemical
Composition
[wt. %]

DIN 1.2709 / MS1 / ~ Marage 300

Element	C	Si	Mn	P	S	Cr	Mo	Ni	Ti	Co
min	-	-	-	-	-	-	4.5	17	0.8	8.5
max	0.03	0.1	0.15	0.01	0.01	0.25	5.2	19	1.2	10.0

THERMAL CONDUCTIVITY - COPPER AND ALUMINUM ALLOYS

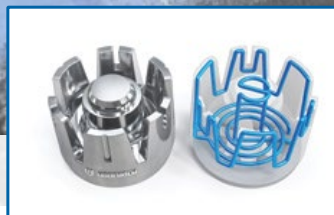




CUSTOM MOLD BASES / PRECISION MACHINING

EDRO specializes in manufacturing high cavitation custom mold bases, regularly producing complex stripper plate, stack and rotational stack mold, auto unwind, and hot-runner mold bases to exacting tolerances. EDRO employs the latest in state-of-the-art technology and equipment with a team of skilled machinists and knowledgeable technicians that pride themselves on producing a first job with unmatched precision and repeatability.

EDRO has implemented many unique quality control techniques to further enhance the accuracy of our work. The finish machining and inspection departments are housed in a temperature controlled environment, and each machine is laser calibrated on a regular basis. These steps together with our proven procedures are performed to ensure that each feature on our mold plates is at its true location, traceable to the US Bureau of Standards, thereby achieving precision alignment, long lasting performance, and mold interchangeability.

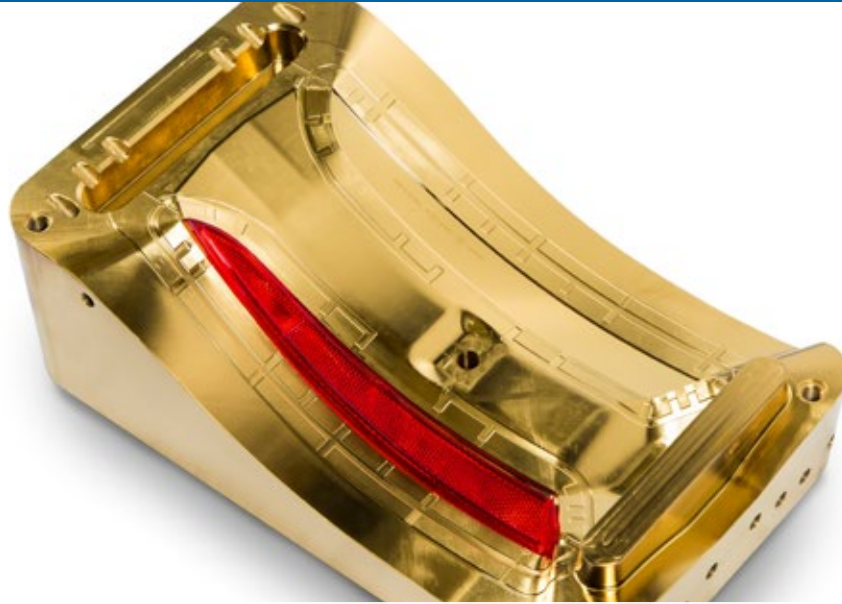


ADDITIVE MANUFACTURING

Offering End-to-End Additive Manufacturing Services from powder to finished components. EDRO and sister company voestalpine Additive Manufacturing Centers in North America provide a ONE-STOP-SHOP developing solutions to meet our customers needs.

- + AMPO® Metal Powders from BÖHLER
- + Design/Engineering/Simulation
- + Serial and prototype part Manufacturing
- + Heat treatment, coatings and machining

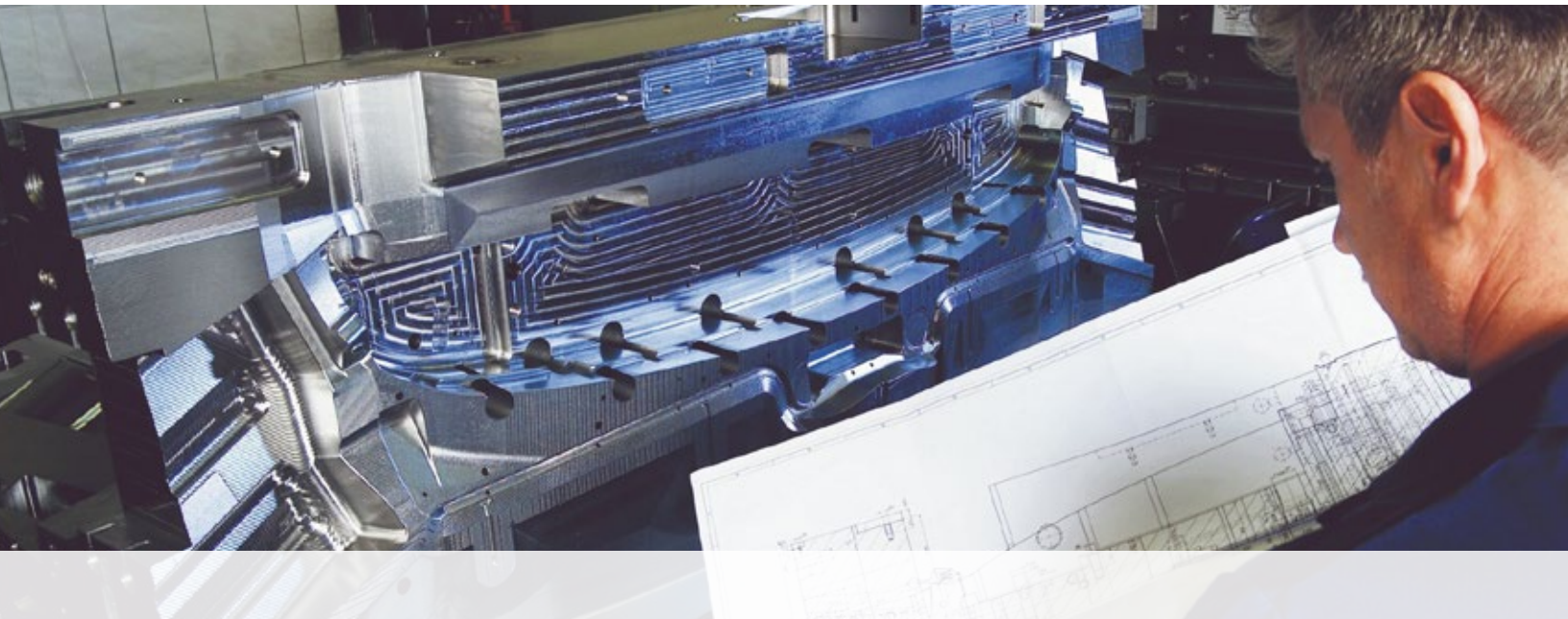
RVICES



PVD/DLC COATINGS

Known as a global leader in Physical Vapor Deposition (PVD) and surface technology, voestalpine eifeler Coatings has partnered with sister company EDRO to offer the latest PVD, DLC and Duplex Treatment technologies.

- + High quality thin film coatings
- + Enhance performance, durability, and appearance
- + State-of-the-art ultrasonic cleaning line
- + In house media blasting and polishing



TECHNICAL SERVICES

EDRO has an experienced team of metallurgists and technicians available to help our customers in all aspects of their their plastics tooling programs. Our dedicated team can assist in mold and design reviews, select the most suitable materials for the job, assist with machining and processing questions, and provide heat treatment and coatings recommendations.

WE HAVE YOU COVERED

EDRO's umbrella of innovative solutions covers all your needs for high performance plastics tooling

CUSTOM MOLD BASES

RoyAlloy
STAINLESS

BÖHLER
TOOL STEELS

ADDITIVE
MANUFACTURING

ALUMINUM
PRODUCTS

eifeler
COATINGS

TECHNICAL
SERVICES

MACHINING
SERVICES

MOLDMAX
MOLD ALLOYS

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