



WE HAVE THE KEY TO YOUR SUCCESS

Segment overviews:

Machining

Cold Work

Semi/Hot Work

Plastic Injection Molding

Components

	Broaches	Hobs Stick blades Shaper cutter and skiving tools	Saw blades	Special cutting tools Indexable inserts
Steel <55 HRC	SUBLIME® EXXTRAL® *	SUBLIME® EXXTRAL® * EXXTRAL®-plus	EXXTRAL®-plus TiCN SUBLIME®	EXXTRAL® SUBLIME®
Steel >55 HRC	SUBLIME® EXXTRAL® *	SUBLIME® EXXTRAL® * EXXTRAL®-plus	SISTRAL® * EXXTRAL®-plus	ARDURO SISTRAL®
Stainless steel	SUBLIME®	SUBLIME® EXXTRAL® * EXXTRAL®-plus	EXXTRAL®-plus TiCN SUBLIME®	SISTRAL®-Gold * SUBLIME®
Cast iron	SUBLIME®	SUBLIME® EXXTRAL® * EXXTRAL®-plus	EXXTRAL®-plus SISTRAL® * SUBLIME®	EXXTRAL® * SISTRAL®-Gold *
Aluminium Si <9 %	ta-C SUBLIME®	EXXTRAL®-Silver EXXTRAL® * EXXTRAL®-plus	CARBON-X®	ZrN ZrCN CARBON-X®
Aluminium Si >9 %	ta-C SUBLIME®	EXXTRAL®-Silver EXXTRAL® * EXXTRAL®-plus	EXXTRAL®-Silver	ta-C ZrCN EXXTRAL®-Silver
Titanium based alloys	SUBLIME®	SUBLIME® EXXTRAL® * EXXTRAL®-plus	SUBLIME®	ARDURO SISTRAL®-Gold * SUBLIME®
Nickel based alloys	SUBLIME®	SUBLIME® EXXTRAL® * EXXTRAL®-plus	SUBLIME®	SUBLIME® SISTRAL®-Gold *
Brass / copper	SUBLIME®	EXXTRAL®-Silver EXXTRAL® * EXXTRAL®-plus	EXXTRAL®-Silver CARBON-X®	EXXTRAL®-Silver CARBON-X®
Wood			EXXTRAL®-Silver	EXXTRAL®-Silver ta-C

* ultrafine on request

	Twist drills Step drills	Taps Thread formers	Reamers	End mills	Thread mills
Steel ≤ 55 HRC	EXXTRAL®-plus SUBLIME® SISTRAL®-Gold	TiN * TiCN * EXXTRAL® * (+MoX2)	TiN * TiCN * EXXTRAL®	SISTRAL® * EXXTRAL® * SUBLIME®	TiN * TiCN * EXXTRAL® * (+MoX2)
Steel > 55 HRC	ARDURO SISTRAL® * EXXTRAL® *	TiN * TiCN * SISTRAL®	TiN * TiCN * SISTRAL® *	ARDURO SISTRAL® *	TiN * TiCN * SISTRAL®
Stainless steel	SUBLIME® SISTRAL® ARDURO	TiN * TiCN * SISTRAL®-Gold *	TiN * TiCN * SISTRAL®-Gold	SISTRAL®-Gold * SUBLIME® ARDURO	TiN * TiCN * SISTRAL®-Gold
Cast iron	EXXTRAL® * SISTRAL® ARDURO	TiN * TiCN * EXXTRAL®	EXXTRAL® SISTRAL® * SUBLIME®	EXXTRAL® * SISTRAL® * SUBLIME®	TiN * TiCN * EXXTRAL® *
Aluminium Si < 9 %	CARBON-X® ZrN	ZrN ZrCN CARBON-X®	ZrN ZrCN CARBON-X®	ZrN ZrCN CARBON-X®	ZrN ZrCN CARBON-X®
Aluminium Si > 9 %	ta-C CARBON-X® ZrN	ta-C ZrCN EXXTRAL®-Silver	ta-C ZrCN EXXTRAL®-Silver	ta-C ZrCN EXXTRAL®-Silver	ta-C ZrCN EXXTRAL®-Silver
Titanium based alloys	ARDURO SISTRAL®-Gold SUBLIME®	SISTRAL®-Gold SUBLIME® TiCN *	SISTRAL®-Gold SUBLIME®	ARDURO SISTRAL®-Gold * SUBLIME®	SISTRAL®-Gold * SUBLIME® TiCN *
Nickel based alloys	ARDURO SUBLIME® SISTRAL®-Gold	SUBLIME® SISTRAL®-Gold	SUBLIME® SISTRAL®-Gold	SUBLIME® SISTRAL® Gold *	SUBLIME® SISTRAL®-Gold *
Brass / copper	EXXTRAL®-Silver CARBON-X®	EXXTRAL®-Silver CARBON-X®	EXXTRAL®-Silver CARBON-X®	EXXTRAL®-Silver CARBON-X®	EXXTRAL®-Silver CARBON-X®
Wood	EXXTRAL®-Silver ta-C		EXXTRAL®-Silver	EXXTRAL®-Silver ta-C	

* ultrafine on request

	Powder pressing	Punching	Fine blanking	Cold forming	Stamping
Steel		Duplex-VARIANTIC®-1400 plus CROSAL®-Plus TiCN *	Duplex-VARIANTIC®-1400 plus CROSAL®-Plus TiCN *	Duplex-VARIANTIC®-1400 plus Duplex-VARIANTIC® TiCN *	Duplex-VARIANTIC® VARIANTIC® TiN *
Stainless steel sheets (≤1.5 mm)		Duplex-VARIANTIC®-1400 plus CROSAL®-Plus TiCN *	Duplex-VARIANTIC®-1400 plus CROSAL®-Plus TiCN *	DUMATIC CROSAL®-Plus TiCN *	DUMATIC CROSAL®-Plus TiCN *
Stainless steel sheets (>1.5 mm)		Duplex-VARIANTIC®-1400 plus Duplex-CROSAL®-Plus DUMATIC	Duplex-VARIANTIC®-1400 plus Duplex-CROSAL®-Plus DUMATIC	Duplex-VARIANTIC®-1000 DUMATIC	Duplex-VARIANTIC®-1000 DUMATIC
High-strength sheets (>1000 N/mm²)		Duplex-VARIANTIC®-1400 plus	Duplex-VARIANTIC®-1400 plus	Duplex-VARIANTIC®-1000	Duplex-VARIANTIC®-1000
Aluminium (Si < 7 %)	Duplex CrCN CrCN	CARBON®-X CrCN	Duplex-CrCN CrCN	CARBON-X®-AL CrCN	CARBON-X®-AL CrCN
Aluminium (Si > 7 %)	Duplex CrCN CrCN	Duplex-CrCN CARBON®-X	Duplex-CrCN CrCN	Duplex-CrCN	Duplex-CrCN CrCN
Galvanized sheets (≤2.0 mm)		Duplex-CrCN CrCN TiCN *	Duplex-VARIANTIC®-1400 plus Duplex-CrCN TiCN *	Duplex-CrCN CrCN TiCN *	Duplex-CrCN CrCN TiCN *
Galvanized sheets (>2.0 mm)		Duplex-VARIANTIC® Duplex-CrCN VARIANTIC®	Duplex-VARIANTIC®-1400 plus Duplex-CrCN DUMATIC	Duplex-CrCN CrCN VARIANTIC®	Duplex-CrCN CrCN VARIANTIC®
Non-ferrous metals	Duplex CrCN CrCN	Duplex-CrCN CARBON®-X CrCN	Duplex-CrCN CrCN	Duplex-CrCN CARBON-X®-AL CrCN	Duplex-CrCN CrCN
Plastics	Duplex CrCN CrCN	Duplex-CrCN CrCN	Duplex-CrCN CrCN	Duplex-CrCN CrCN	Duplex-CrCN CrCN
Metallic powders	Duplex CrCN CrCN				

* ultrafine on request



COLD FORMING

	Cutting	Roll forming	Sendizimir rolling	Thread rolling
Steel	CROSAL®-Plus TOPMATIC EXXTRAL®-Plus	Duplex-VARIANTIC®-1000 Duplex-VARIANTIC® TiCN *	Duplex-VARIANTIC®-1000 Duplex-VARIANTIC® TiCN *	Duplex-CROSAL®-Plus CROSAL®-Plus TiCN *
Stainless steel sheets (≤1.5 mm)	CROSAL®-Plus TiCN *	Duplex-VARIANTIC®-1000 DUMATIC TiCN *	Duplex-VARIANTIC®-1000 DUMATIC TiCN *	Duplex-CROSAL®-Plus DUMATIC TiCN *
Stainless steel sheets (>1.5 mm)	Duplex-CROSAL®-Plus DUMATIC	Duplex-VARIANTIC®-1000 DUMATIC TiCN *	Duplex-VARIANTIC®-1000 DUMATIC TiCN *	Duplex-CROSAL®-Plus DUMATIC TiCN *
High-strength sheets (>1000 N/mm²)	Duplex-VARIANTIC®-1400 plus	Duplex-VARIANTIC®-1000	Duplex-VARIANTIC®-1000	Duplex-VARIANTIC®-1400 plus
Aluminium (Si <7 %)	CARBON-X® CrCN	CARBON-X®-AL CrCN	CARBON-X® CrCN	Duplex-CrCN CrCN
Aluminium (Si >7 %)	Duplex-CrCN CrCN	Duplex-CrCN CARBON-X®-AL CrCN	Duplex-CrCN CARBON-X®-AL CrCN	Duplex-CrCN CrCN
Galvanized sheets (≤2.0 mm)	Duplex-CrCN CROSAL®-Plus CrCN	Duplex-CrCN CARBON-X®-AL CrCN	Duplex-CrCN CARBON-X®-AL CrCN	Duplex-CROSAL®-Plus DUMATIC TiCN *
Galvanized sheets (>2.0 mm)	Duplex-CROSAL®-Plus Duplex-CrCN CROSAL®-Plus	Duplex-CrCN CrCN TiCN *	Duplex-CrCN CrCN TiCN *	Duplex-CROSAL®-Plus DUMATIC TiCN *
Non-ferrous metals	Duplex-CrCN CARBON-X® CrCN	Duplex-CrCN CARBON-X®-AL CrCN	Duplex-CrCN CARBON-X®-AL CrCN	Duplex-CrCN CrCN
Plastics	Duplex-CrCN CrCN	Duplex-CrCN CrCN	Duplex-CrCN CrCN	Duplex-CrCN CrCN
Metallic powders				

* ultrafine on request

SEMI / HOT WORK

		Aluminium	Aluminium sheets (Si < 7 %)	Aluminium sheets (Si > 7 %)	Galvanized sheets (≤ 2.0 mm)	Galvanized sheets (> 2.0 mm)	Non-ferrous metals	Plastics
Punching	SHW	ZrN	ZrN	CrN	TiCN	CVD TiC/TiN	CrN	CrN, CrCN, CARBON-X®
	HW	CROSAL®-plus	CROSAL®-plus	CROSAL®-plus	CROSAL®-plus	CROSAL®-plus		
Pressing	SHW	CrN	CrN	CrN	TiCN	Duplex-VARIANTIC®	CrN	CrN
	HW	CROSAL®-plus						
Bending	SHW	CrN	CrN	CrN	VARIANTIC®	Duplex-VARIANTIC®	CrN	CrN, CrCN, CARBON-X®
	HW	CROSAL®-plus						
Deep drawing	SHW	CrN	CrN	EXXTRAL®-Silber	TiCN	Duplex-VARIANTIC®	CrN	
	HW							
Rolling	SHW	CrCN	CrCN	EXXTRAL®-Silber	TiCN	DUMATIC		
	HW							
Forging	SHW							
	HW	Duplex-TIGRAL®, Duplex-CrCN, CrN						
Extrusion	SHW							
	HW	Duplex-CrCN, CrN, ZrN						
Die forms	SHW							
	HW	Duplex-TIGRAL®, Duplex-CrCN, CrN						

		Steel	Stainless steel sheets (≤1.5 mm)	Stainless steel sheets (>1.5 mm)	Sheets (< 700 N/mm ²)	Sheets (>700 N/mm ² and <1000 N/mm ²)	Sheets (> 1000 N/mm ²)
Punching	SHW	EXXTRAL®-plus	CROSAL®-plus	CROSAL®-plus, SISTRAL®	Duplex-TIGRAL®,CROSAL®- plus, VARIANTIC®	VARIANTIC®	Duplex-VARIANTIC® 1400
	HW	VARIANTIC®	SISTRAL®, CROSAL®-plus	CROSAL®-plus, SISTRAL®	CROSAL®-plus	CROSAL®-plus	CROSAL®-plus
Pressing	SHW	VARIANTIC®	TiCN	TiCN	VARIANTIC®	VARIANTIC®	Duplex-VARIANTIC® 1400
	HW						
Bending	SHW	VARIANTIC®	TiCN	TiCN	VARIANTIC®	VARIANTIC® 1000	Duplex-VARIANTIC® 1400
	HW	CROSAL®-plus					
Deep drawing	SHW	VARIANTIC®	TiCN	TiCN	VARIANTIC®	VARIANTIC®	
	HW						
Rolling	SHW	VARIANTIC®	TiCN	TiCN	VARIANTIC®	VARIANTIC®	Duplex-VARIANTIC® 1000 Duplex-VARIANTIC® 1400
	HW						
Forging	SHW	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus		
	HW	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus		
Extrusion	SHW	VARIANTIC®					
	HW	Duplex-TIGRAL®, CROSAL®-plus					
Die forms	SHW		Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus		
	HW		Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus	Duplex-TIGRAL®, Duplex-CROSAL®-plus		
Presshardening	SHW	MOLDADUR®, Duplex-TIGRAL®					
	HW						



		CHROME-X®	TiN*	TiCN*	CrN / CrN-Multilage	EXXTRAL®-plus*	DLC
Thermoplastics	Polyolefine – PE, PP, PB	++	+		++		+++
	Styrene polymerisates – PS, SB, SAB, ABS, ASA	++	+++		++		
	Chlorine-containing polymerisates – PVC	++			++		
	Fluorine-containing polymerisates – PTFE, PVDF	++			++		
	Acetal resins – POM	++	++		++		
	Polyamide – PA	+++	+++		+++	++	++
	Linear polyester – PC, PBT(B), PET(P)	+++	+++		+++		++
	Polyarylenethene – "PEEK, PPS, PSU, PES, PPE, PPO"	+++	+	++	+++	+++	
	Polyimide – PI		+++				
	Cellulose ester – CA, CP, CAP		+++				
	Polyacrylates – PMMA		+++				
	Polyurethanes – TPU	+++			+++		
Thermosets	Polyurethanes – PUR	+			+		
	Aminoplastics – MF, UF, MP	+++	++		+++		
Elastomers	Polyurethanes – PUR	+			+		
	Synthetic rubber – NBR, EPDM, SI	++			++		
	Fluorinated elastomers – Multipolymer-TPF, FPM	++			++		
Wear types	Abrasion	+	++	+++	++	+++	+
	Adhesion	++	+	+	++	+	+++
	Corrosion	+++		+	+++	++	++

+ = suitable

++ = well suitable

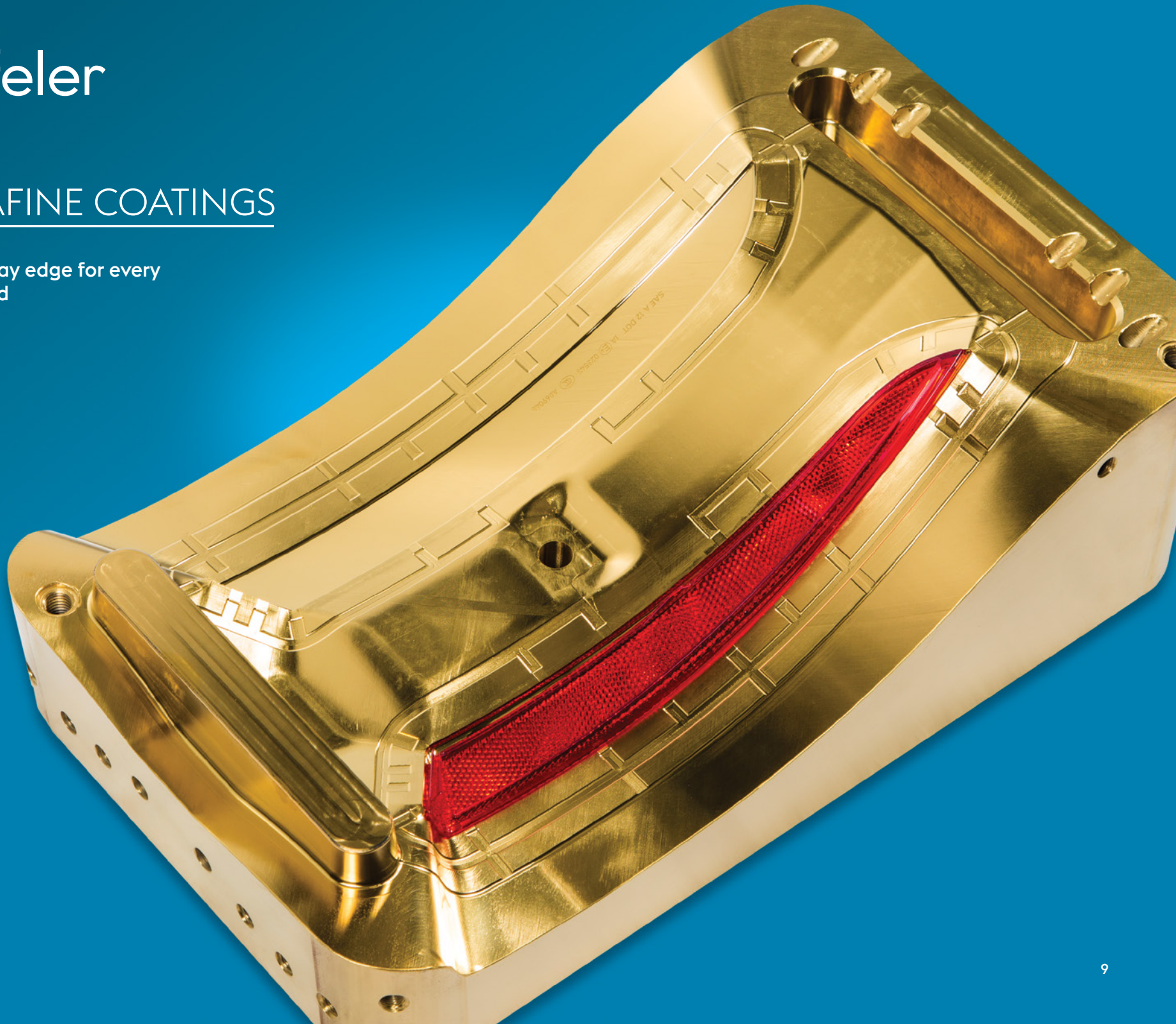
+++ = very well suitable

* ultrafine on request



ULTRAFINE COATINGS

The everyday edge for every
plastic mold



	Application	Material	Steel group	Wear types			
				Adhesion	Abrasion	Corrosion	Fatigue
Automotive industry	Piston pins / piston rings	16CrMo4	Hot work construction steel	SUCASLIDE® CARBON-X®			Plasma nitriding CARBON-X®
	Valves	15NiMn6	Cold work construction steel				
	Camshafts	31CrMo12	Nitriding steels				
	Cup plunger	X42Cr13	Matensitic chrome steels				
General components Oil and Gas Power generation	Gears / bearing	100Cr6	Bearing steels	CARBON®-X-WC/C CARBON-X®-AL SUCASLIDE®			Plasma nitriding CARBON-X®
	Clamping tools	42CrMo4	Heat treatable steels				
	Pumps	C60	General construction steel				
	Routings	16MnCr5	Case-hardening steels				
Medical technology Food industry	Instruments	X5CrNi18-10	Austenitic stainless steels			Med TiN, Med TiCN Med ZrN, Med ZrCN Med CrN Med AlTiN SUCASLIDE®	
	Dental Abutments	TiAlV6	Titan alloys				
	Device components	PPE-POM-PC	Mold steels				
	Implants	X2NiCoMo18-9-5	Cobalt alloys				
Aviation	Areo Engines	TiAlV6	Titan alloys	CARBON-X®-WC/C CARBON-X®-AL SUCASLIDE®			Plasma nitriding CARBON-X®
	Flaps und Slats	AlMgSi1	Aluminium alloys				
	Landing gears	CuZn40	Nickel alloys				
	Hydraulic parts	HSS	High-speed steel				
Mining Renewable energies Safety	Piston pins / piston rings	35MnSi5	Heat treatable steels	CARBON®-X-WC/C CARBON®-X-AL SUCASLIDE®			Plasma nitriding CARBON-X®
	Valves	17-7PH	Precipitation-hardened				
	Camshafts	GX25CrNiSi18-9	steels				
	Cup plunger	11SMn30	Cast iron Free-cutting steels				
Other components	Watches	Fe/Si-Oxid	Ceramics			CHROME-X® SISTRAL®-Gold EXXTRAL®-plus VARIANTIC® DUMATIC SISTRAL® SUCASLIDE®	
	Cr-Look parts	HM	Hard metals				
	Weapons	42CrMo4	Heat treatable steels				
	Sanitary	CrCoMo(30-65-5)	Copper alloys				



OUR DLC COATINGS

Turn friction into flow, and motion
into mastery



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ONE STEP AHEAD.