

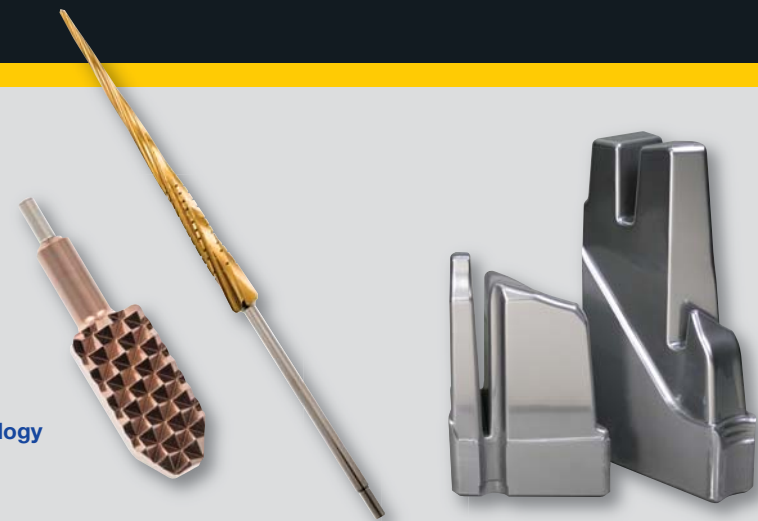
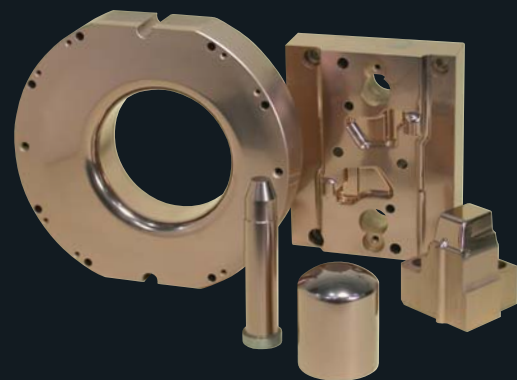
We take perfection personally.

Coating Selection Guide

Additional Coating Services

eifeler Coatings Technology can service all coating requirements from new tooling programs to the refurbishment and recoating of existing tools. Our capabilities include:

- ▶ Mechanical and Chemical Coating Removal
- ▶ Polishing
- ▶ Micro-Blasting
- ▶ PVD Coating of Small to Large Tooling
- ▶ Pick-up and delivery



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PVD, Cathodic Arc Coatings of eifeler - Properties and Applications

	TiN	TiCN	ZrN	CrN	EXXTRAL® plus	EXXTRAL® rose	EXXTRAL® blue	EXXTRAL® silver	CROSAL®	SISTRAL®	TIGRAL	VARIANTA®	VARIANTIC®	WC/C
Coating Designation	Titanium Nitride	Titanium Carbo-Nitride	Zirconium Nitride	Chromium Nitride	Aluminum Titanium Nitride	Aluminum Titanium Carbo-Nitride	Aluminum Titanium Nitride (w/additives)	Aluminum Titanium Chromium Nitride	Aluminum Chromium Nitride	Aluminum Titanium Nitride (w/additives)	Aluminum Chromium Titanium Nitride	Titanium Aluminum Nitride	Titanium Aluminum Carbo-Nitride	Tungsten Carbide Carbon
	TiN	TiCN (multi-layered)	ZrN	CrN	AlTiN (stacked)	AlTiCN (stacked)	AlTiN (nanostructured)	AlTiCrN (stacked)	AlCrN	AlTiN (nanostructured)	AlCrTiN	TiAlN (ML)	TiAlCN (ML)	a-C:Me
Microhardness (Vickers)	2300±300	3500±500	2800±300	2000±200	3300±300	3000±300	3500±500	3000±300	3200±300	3500±500	3300±300	3500±500	3500±500	1000-2200
Friction Coefficient Against Steel (Dry)	0.6	0.2	0.5	0.3 - 0.4	0.7	0.2	0.7	0.4	0.45	0.7	0.6	0.7	0.2	0.2 - 0.25
Coating Thickness ¹⁾ (µm)	2-4	2-4	1-4	2-6	2-4	2-4	1-3	2-4	2-5	2-4	3-5	2-4	2-4	1-4
Thermal Threshold	500°C 900°F	400°C 750°F	600°C 1100°F	600°C 1100°F	800°C 1470°F	800°C 1470°F	900°C 1650°F	800°C 1470°F	1100°C 2012°F	900°C 1650°F	900°C 1650°F	800°C 1470°F	800°C 1470°F	400°C 750°F
Color of the Coating	gold	blue gray (anthracite)	pale yellow	silver-gray	anthracite	light rose	blue-violet	silver	slate-gray	anthracite	dark gray	anthracite	old rose	black
Key Characteristics	standard all-purpose coating	high hardness excellent abrasive wear resistance enhanced toughness	decorative color, good wear and corrosion resistance	low stress / good adhesion, high toughness and corrosion resistance	high hardness, very good oxidation resistance, low thermal conductivity	high hardness and elasticity, low friction, high oxidation resistance	extreme wear resistance at high temperature, excellent oxidation resistance	high hardness, good oxidation resistance, low friction	extreme hot hardness, high oxidation resistance and high adhesive strength	extreme wear resistance at high temperature, excellent oxidation resistance	high warm hardness, very high oxidation resistance, high protection against abrasive wear	high hardness, very good oxidation resistance	low friction, good oxidation resistance	high lubricity, low tendency for adhesive wear
Primary Applications	<ul style="list-style-type: none"> machining / cutting of iron based materials metal forming plastic molding of highly abrasive plastics orthopedic instrumentation 	<ul style="list-style-type: none"> machining of difficult-to-machine alloy steels high performance cutting where moderate temperatures are generated at the cutting edge excellent for metal forming (stainless steel) excellent for machining of aluminum alloys orthopedic instrumentation 	<ul style="list-style-type: none"> cast aluminum and generally non-ferrous materials machining machining of fiberglass, nylon and most polymer materials forming and punching - reduced cold welding decorative applications orthopedic instrumentation 	<ul style="list-style-type: none"> drawing, pressing, bending and stamping of copper and other non-ferrous materials metal forming plastic molding available with in-situ Duplex treatment 	<ul style="list-style-type: none"> machining of hardened steel and thicker steel sheets excellent chemical resistance for use on round shank carbide tools high speed machining operations, semi-dry or dry machining 	<ul style="list-style-type: none"> excellent for stainless steel and nickel-based high temperature alloys hard and copy milling interrupted cutting operations lubricated, semi-dry or dry machining exclusive to eifeler Coatings Technology 	<ul style="list-style-type: none"> cutting extremely abrasive or hard materials machining of hardened steel (>55 HRc) machining of cast steel, cast iron, Si-rich Al alloys high performance machining, semi-dry or dry machining 	<ul style="list-style-type: none"> machining of abrasive or sticking materials (stainless steel, cast iron, Si-rich Al-alloys) machining of hardened steel (>55 HRc) cutting of Al-alloys & non-ferrous metals 	<ul style="list-style-type: none"> cutting: high performance cutting, hobbing, dry broaching forming / punching: fine blanking, hot pressing, Al die casting 	<ul style="list-style-type: none"> excellent choice for cutting under extreme conditions (hard, abrasive materials, high temp, high speed, dry cutting) machining of hardened steel (>55 HRc) nickel-based alloy machining stamping of stainless steels 	<ul style="list-style-type: none"> warm forming, hot forging, and die casting coating for milling with carbide, cermet and high speed steel tools machining under dry conditions and high feeds available with in-situ Duplex treatment high speed operations, semi-dry or dry machining orthopedic instrumentation 	<ul style="list-style-type: none"> coating for a wide range of carbide, cermet and high speed steel tooling machining of cast iron and nickel based high temperature alloys high speed operations, semi-dry or dry machining orthopedic instrumentation available with in-situ Duplex treatment 	<ul style="list-style-type: none"> coating for a wide range of carbide, cermet and high speed steel tooling machining of all types of steel under dry as well as wet machining conditions drawing, stamping, punching, forming tools for processing of high and low alloy steel orthopedic instrumentation available with in-situ Duplex treatment 	<ul style="list-style-type: none"> on top of hard coatings for reduction of friction precision components: automotive, aerospace, medical

¹⁾ depends on size of tools, for micro tools a lower thickness may be necessary.

Other application specific coatings available upon request. For further information and contact details please check our website: www.eifeler.us or www.bucanada.ca

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