

PVD COATINGS FOR
STAMPING/FORMING
APPLICATIONS

STAMPING AND FORMING PORTFOLIO



voestalpine eifeler coatings offers a large portfolio of PVD coatings to increase the life of your stamping, forming and punching tools.

Our special Duplex technology combines in one process a high quality plasma-Nitriding and a low nano-layered PVD coating, creating a unique solution for any problem associated to the stamping and forming operations.

Forming of Advanced High Strength Steels (AHSS) demands more from forming tools.

Metal forming tools require a robust surface solution to ensure and increase high productivity.



Our coatings offer a reliable wear protection through outstanding surface quality.

BENEFITS

- » Higher Productivity
- » Less Down Time
- » Lower Tooling Costs
- » Longer Tooling Life
- » Reduced Lubricant Consumption
- » Adhesive Wear

FEATURES

The reduced application temperature of our coatings ensure that the metallurgical and dimensional characteristics of the coated tools are not compromised. Our unique nano-layers composition greatly reduces stress and improves ductility under high loads preventing micro-cracks in the film thus increasing coating longevity.

In addition, our coatings offers improved lubricity, high hardness and anti-corrosive properties.

- » High Hardness
- » Wear Resistance
- » Toughness
- » Low Coefficient of Friction
- » Galling Resistance
- » Corrosion Resistance
- » High Temperature Stability

ADDITIONAL COATING SERVICES

voestalpine eifeler Coatings 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



PROPERTIES & APPLICATIONS GUIDE

	TiN	TiCN	CrN/CRCN	DUMATIC	VARIANTIC®	VARIANTIC®-1000	TIGRAL®	CARBON-X®
Coating Material	Titanium Nitride	Titanium Carbo-Nitride	Chromium Nitride	Titanium Carbide	Titanium Aluminum Carbo-Nitride	Titanium Aluminum Carbo-Nitride	Aluminum Chromium Titanium Nitride	DLC
	TiN	TiCN (ML)	CrN/Chrome Carbon-Nitride	TiC	TiAlCN (ML)	TiAlCN (ML)	AlCrTiN	a-C:H
Microhardness HV_{0.05}	2300±300	3500±500	2000±200 / 2300±200	3700±500	3500±500	4000±200	3300±300	2400±400
Friction Coefficient Against Steel (Dry)	0.6	0.2	0.3-0.4 / 0.2-0.3	0.25	0.2	0.4	0.6	0.1-0.2
Coating Thickness ¹⁾ (µm)	2-4	2-4	1-6 / 2-6	3-5	2-4	6-8	3-8	1.5-2.5
Thermal Threshold	500°C / 900°F	400°C / 750°F	600°C / 1100°F	400°C / 750°F	800°C / 1470°F	800°C / 1470°F	900°C / 1650°F	325°C / 617°F
Color of the Coating	gold	blue gray	slate gray/silver-gray	gray	old rose	old rose	dark gray	anthracite
Key Characteristics	standard, all-purpose coating	high hardness, excellent abrasive and wear resistance, enhanced toughness	low stress levels, high level of adhesion, high corrosion resistance	highest levels of hardness and abrasion resistance	low friction, high oxidation resistance	high oxidation resistance, high protection against abrasive wear	high hardness, high oxidation resistance, superior abrasion resistance	high hardness, very good oxidation resistance
Key Applications	Cutting Punching/Forming Medical	Cutting Punching/Forming Medical	Machining of copper and other non-ferrous metal, metal forming, plastic molding (improved demolding), aluminum and magnesium die casting	Forming	Cutting Punching/Forming Medical	Cutting Forming	Trimming Punching/Forming Die Casting	Cutting Forming Medical
Ultrafine Available Biocompatible	ultrafine Available Biocompatible	ultrafine Available Biocompatible	Biocompatible	N/A	Duplex Available Biocompatible	Duplex Available	Duplex Available	Biocompatible
Duplex® Capability	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Primary Applications

- » machining/cutting of iron based materials
- » metal forming
- » plastic molding

- » 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)

- » machining
- » Shaping
- » aluminum die casting
- » plastic molding

- » drawing tools, stamping tools, pressing tools and forming tools for the working of high-alloy chrome/nickel materials and similar requirements.

- » 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

- » machining under dry conditions
- » hot forming sheet metals
- » die casting

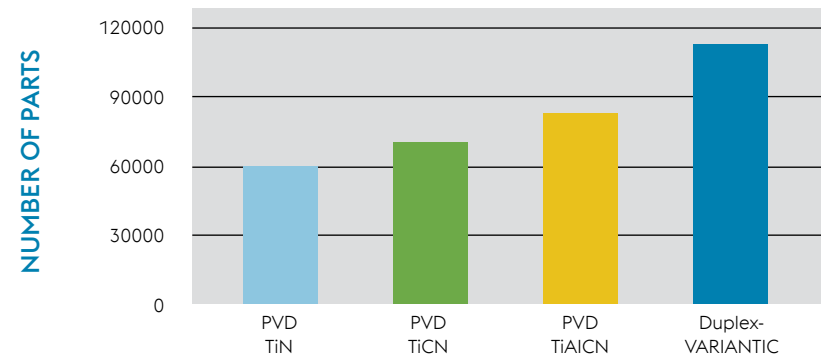
- » cast aluminum and generally non-ferrous materials machining
- » high pressure aluminum die casting
- » forming and punching

- » 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

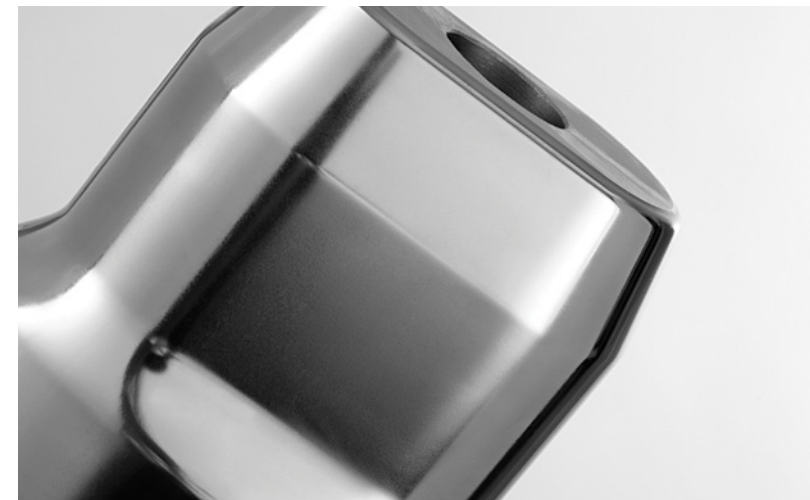
¹⁾ depends on size of tools, for micro tools also smaller thicknesses necessary.

EXAMPLE IN HIGH STRENGTH METAL FORMING

Nearly 50% improvement in tooling life over conventional PVD coatings.



D2 forming die, coated with Duplex-VARIANTIC work material: hot rolled 1.0335 steel.



Other application specific coatings available upon request. For further information and contact details please check our website: www.eifeler.com/northamerica

This information is based upon our present state of knowledge and is intended to provide general notes on products and their uses. It should not, therefore, be construed as a warranty of specific properties of the products described, or, as a warranty of suitability for a particular purpose.

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