



BIHLER COATINGS FOR PUNCHING AND BENDING TOOLS

„Layer for layer less tool wear and increased productivity“

A perfect surface coating is like a second skin to your punching and bending tools. Bihler relies on the surface coating technology supplied by international market leader Balzers. Our PVD surface coating facility is suitable for a large variety of applications and material related hard-material coating systems, and can be used without restriction by all Bihler customers.

The big advantage of surface coatings is reflected in the significant increase in the durability of surfaces subject to wear. For this purpose, coatings with optimized friction properties and a reduced tendency to cold-welding have been developed over the course of the years.

As a consequence, even difficult bending and cutting operations can be carried out entirely or partially without the use of a suitable lubricant. However, a perfect coating demands preparatory work of an equally high standard. Subject to the components' areas of application, their operating surfaces must be prepared accordingly. This service, and the manufacture of wear parts and complete modules such as cutting, bending and assembly tools is offered additionally to you as a result of our many years of experience.

Increase the value of your tools – for greater performance and extended durability!



BIHLER

Benefit in both the economical and technological aspects

- Delivery of wear parts ready for use
- Increased durability due to reduced wear
- Greater productivity due to reduced machine down time
- Increased process safety due to optimized friction properties
- Material forming behavior improved due to adapted coating materials
- Reduced tendency to cold-weld improves surface of production components
- Lower coefficient of friction reduces punch and with-drawal forces
- High surface-quality reduces burr formation during punching
- Possible to apply new coatings after grinding or other finishing processes

Innovative coating systems from Bihler

Subject to application and material the following hard-material coatings can be applied:
Maximum component dimensions: Diameter or cross section 250 mm x length 450 mm

	BIHLER A	BIHLER B	BIHLER D	BIHLER FUTURA	BIHLER FUTURA NANO	BIHLER X.TREME
Coating material	TiN	TiCN	CrN	TiAlN	TiAlN	TiAlN
Micro hardness (HV 0,05)	2300	3000	1750	3000	3300	3500
Friction coefficient on steel (dry)	0,4	0,4	0,5	0,4	0,30 - 0,35	0,4
Coating thickness (μm)	1-2, 3-4	1-2, 3-4	1-2, 3-4/10	1-2, 3-4	1,3 / 1,5	0,5-1,5 1,5-2,5
Application temp. (max. °C in air)	600	400	700	800	900	800
Coating color	gold-yellow	blue-grey	silver-grey	violet-grey	violet-grey	violet-grey
Coating composition	Monolayer	Multilayer, graded	Monolayer	Multilayer	Nanostructure	Monolayer

	PROPERTIES	APPLICATION
BIHLER A	Multi-purpose standard surface coating	Steel machining, friction reduction
BIHLER B	High hardness level, good toughness	For tools subject to high mechanical loads (punching, forming and milling)
BIHLER D	Corrosion and oxidation resistant	Copper machining, low-temperature forming
BIHLER FUTURA	High elevated-temperature hardness, oxidation resistant	For HSS and HM tools with high thermal loads (drilling, milling, turning, HSC, dry machining)
BIHLER FUTURA NANO	Optimized ratio (hardness/residual compressive stress), increased thermal and chemical resistance, improved sliding properties, greater wear resistance	Tools subject to high thermal and abrasive loads
BIHLER X.TREME	High hardness level, chemical stability	For HM tools, specifically for hard machining and HSC

(Subject to change 10/06)