VUHZ | ADVANCED METAL TECHNOLOGIES

COATING CENTRE

PVD / PACVD / CVD

ABOUT US

The Coating Centre at VÚHŽ was established in 1994. The intention was to create a centre dealing with surface treatments, primarily of metal materials. Three coating technologies were gradually implemented into the centre - CVD, PACVD and PVD. Thanks to this, the Coating Centre is now able to respond flexibly to various customer requirements and offer them solutions to their problems. The actual coating is carried out using four coating machines, which offer not only proven standard coatings, but also special coatings developed for specific applications.

1994
establishment of the centre focusing on surface treatments

1999
procurement of CVD coating machine

2008
procurement of PACVD coating machine

2012
procurement of PVD coating machine FX850

2013
procurement of PVD coating machine Fx1200

2023
extensive modernization of the PVD coating unit Fx1200

BENEFITS OF COATING TECHNOLOGIES

PVD

- large range of coating materials (steel, carbide, aluminium alloys)
- wide range of coatings with different chemical compositions
- hard DLC carbon layers with low coefficient of friction
- possibility of coatings applying at low temperatures (from 180 °C)

CVD

- excellent coating adhesion and wear resistance
- greater coating thickness (up to 20 μm)
- possibility of coating of holes and cavities

PA CVD

- lower coating temperature compared to CVD technology
- significant reduction in sticking of the processed material
- possibility of surface hardening by plasma nitriding
- possibility of coating of holes and cavities

STANDARD COATINGS

	Coating	Micro-hardness (HV)	Thickness (µm)	Friction coefficient	Coating temp. (°C)	Working temp. (°C)	Type	Colour
PVD	BASICCOMP	2500	1-6	0,4	450	600	TiN	golden
PVD	STANDARDCOMP	3000	1-4	0,4	450	400	TiCN	bronze
PVD	ALUCOMP	2500-3000	1-6	0,4	450	900	AlTin	dark grey
PVD	PRESSCOMP	1500-2500	1-10	0,4	450	700	CrN	silver-grey
PVD	UNICOMP	3000	1-6	0,55	450	1100	AlCrN	grey
PVD	DLC COMP	2000-4000	1-3	0,05-0,15	180-300	350	a-C:H	black
PACVD	NANOCOMP	2500-3200	2-4	0,4-0,5	520	800	TiB2	yellow-grey
PACVD	BORCOMP	3000-3400	2-4	0,4-0,5	up to 600	800	TiBN	grey
CVD	CVD HARD	3000-4000	1-20	0,5-0,6	1000	600	TiCN	golden

PVD CVD PACVD

SPECIAL COATINGS

Coating	Micro-hardness (HV)	Thickness (µm)	Friction coefficient	Coating temp. (°C)	Working temp. (°C)	Colour
FLEXCOMP	2000-4000	3-4	0,05-0,15	450	350	black
PROTECTCOMP	1500-2500	2-3	0,4	400	500	silver/golden
HARDCOMP	4000-6000	1-3	0,05-0,15	200	300	iridescent/black
SILLCOMP	1500-2500	1-5	0,02-0,1	180-300	450	black
HLF COMP	2300	1-5	0,2	450	350	dark grey
MAXCOMP	2300	1-5	0,2	180-300	350	dark grey
MULTICOMP	2500-3500	2-6	0,4	450	600	golden
ZIRCOMP	1800	1-4	0,5	450	550	white-golden
FORMCOMP	1600-2000	2-6	0,5	200-450	600	silver-grey
VANCOMP	1900-2200	2-6	0,4-0,6	450	900	silver-grey

COATING APPLICATION

application/coating	BASICCOMP	STANDARDCOMP	ALUCOMP	PRESSCOMP	UNICOMP	DLC COMP	NANOCOMP	BORCOMP	CVD HARD	FLEXCOMP	PROTECTCOMP	HARDCOMP	SILLCOMP	HLF COMP	MAXCOMP	MULTICOMP	ZIRCOMP	FORMCOMP	VANCOMP
machining of common steels	●	●	●																
machining of hard materials			●		●					●				●		●			
machining of non-ferrous metals	●			●		●				●		●	●				●	●	
steel cutting	●	●							●							●			
metal forming	●	●		●		●			●	●		●			●	●	●		
plastic processing				●		●	●											●	
non-ferrous metal die casting					●		●	●											●
sliding and rolling elements						●						●	●	●	●				
antibacterial properties											●								

STANDARD COATINGS

SPECIAL COATINGS

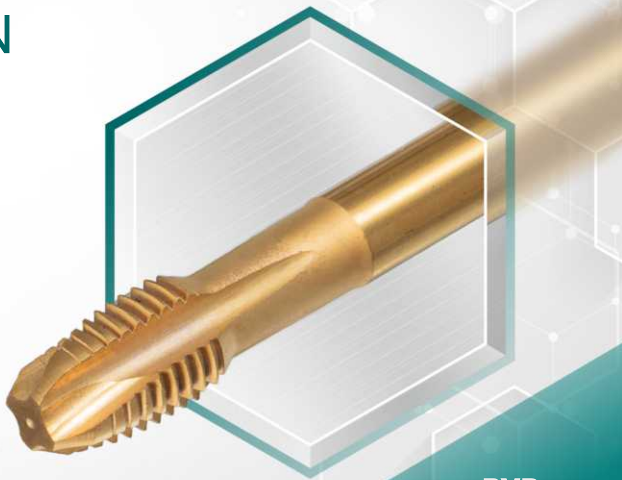
PRODUCTION POSSIBILITIES

TECHNOLOGY	PVD	CVD	PA CVD
temperature	180 – 500 °C	1000 °C	520 °C
height	850 mm	400 mm	1000 mm
diameter	650 mm	200 mm	700 mm
mass	1000 kg	15 kg	1250 kg

BASICCOMP TiN

the most widely used universal coating for light applications

milling, drilling, reaming,
threading, broaching, punching
and forming of steel sheets



Basic properties

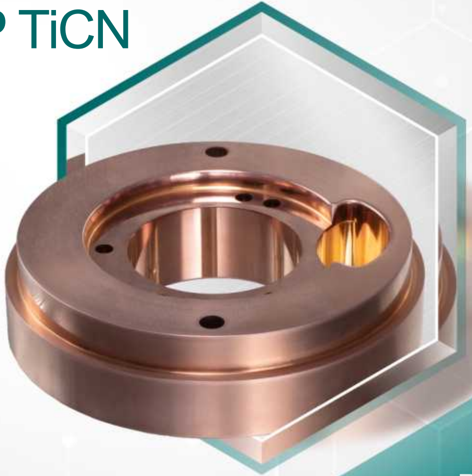
Micro-hardness (HV)	2500
Thickness (μm)	1-6
Friction coefficient	0,4
Coating temperature (°C)	450
Working temperature (°C)	600
Colour	golden

PVD STANDARD COATINGS

STANDARDCOMP TiCN

highly resistant coating for cutting, machining, and metal shearing

milling, threading, pressing,
shearing, punching of steel
and stainless steel sheets



Basic properties

Micro-hardness (HV)	3000
Thickness (µm)	1-4
Friction coefficient	0,4
Coating temperature (°C)	450
Working temperature (°C)	400
Colour	bronze

PVD STANDARD COATINGS

ALUCOMP AlTiN

high-effective coating for higher-strength materials machining

milling, drilling, reaming of standard and hardened steels, rolling, turning

Basic properties

Micro-hardness (HV)	2500-3000
Thickness (μm)	1-6
Friction coefficient	0,4
Coating temperature (°C)	450
Working temperature (°C)	900
Colour	dark grey

PVD STANDARD COATINGS

PRESSCOMP CrN

abrasion-resistant coating for forming and plastics processing and machining

machining of non-ferrous metals,
tools and molds for metal forming,
molds for plastic injection

Basic properties

Micro-hardness (HV)	1500-2500
Thickness (µm)	1-10
Friction coefficient	0,4
Coating temperature (°C)	450
Working temperature (°C)	700
Colour	silver-grey

PVD STANDARD COATINGS

UNICOMP AlCrN

very hard coating for machining and casting of non-ferrous metals

die casting of aluminium, magnesium and zinc, milling of very hard materials, turning

Basic properties

Micro-hardness (HV)	3000
Thickness (µm)	1-6
Friction coefficient	0,55
Coating temperature (°C)	450
Working temperature (°C)	1100
Colour	grey

PVD STANDARD COATINGS

DLC COMP a–C:H

high-hardness carbon-based sliding coating

machining of non-ferrous metals,
molds for forming and plastics injection,
sliding and rolling elements

Basic properties

Micro-hardness (HV)	2000-4000
Thickness (µm)	1-3
Friction coefficient	0,05-0,15
Coating temperature (°C)	180-300
Working temperature (°C)	350
Colour	black

PVD STANDARD COATINGS

NANOCOMP TiB2

composite coating for processing of highly adhesive materials

non-ferrous metal die casting,
plastic injection molds, tools
in the food industry

Basic properties

Micro-hardness (HV)	2500-3200
Thickness (μm)	2-4
Friction coefficient	0,4-0,5
Coating temperature (°C)	520
Working temperature (°C)	800
Colour	yellow-grey

PACVD STANDARD COATINGS

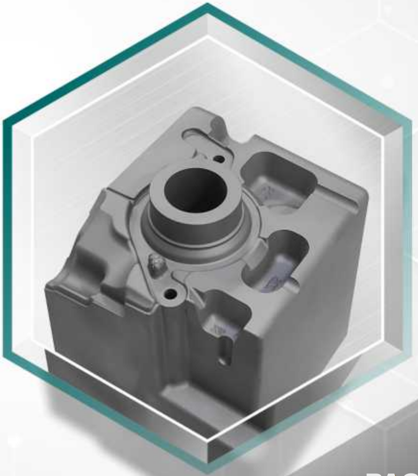
BORCOMP TiBN

**high-efficient boron-based coating
for non-ferrous metal casting**

highly stressed parts of molds
for pressure casting of non-ferrous
metals (aluminium, magnesium, zinc)

Basic properties

Micro-hardness (HV)	3000-3400
Thickness (µm)	2-4
Friction coefficient	0,4-0,5
Coating temperature (°C)	do 600
Working temperature (°C)	800
Colour	grey



**PACVD
STANDARD
COATINGS**

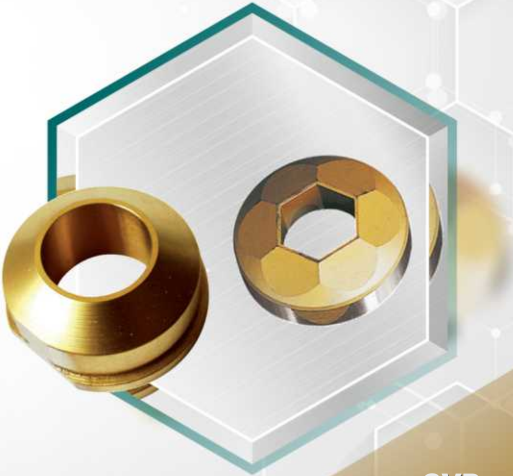
CVD HARD TiCN

proven hard coating for very demanding operations

pressing, bending and shearing with extremely high mechanical loads

Basic properties

Micro-hardness (HV)	3000-4000
Thickness (µm)	1-20
Friction coefficient	0,5-0,6
Coating temperature (°C)	1000
Working temperature (°C)	600
Colour	golden



CVD STANDARD COATINGS

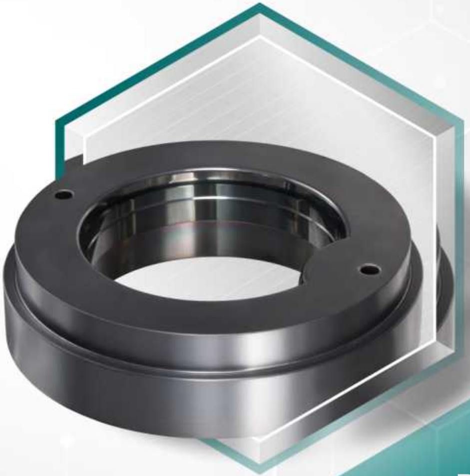
FLEXCOMP

duplex sliding coating for metal machining and forming

milling of tool steels and non-ferrous metals, highly stressed pressing tools

Basic properties

Micro-hardness (HV)	2000-4000
Thickness (µm)	3-4
Friction coefficient	0,05-0,15
Coating temperature (°C)	450
Working temperature (°C)	350
Colour	black



PVD SPECIAL COATINGS

PROTECTCOMP

antibacterial coating eliminating the occurrence of bacteria and viruses

products for special spaces requiring antibacterial treatment - handles, fittings, handrails

Basic properties

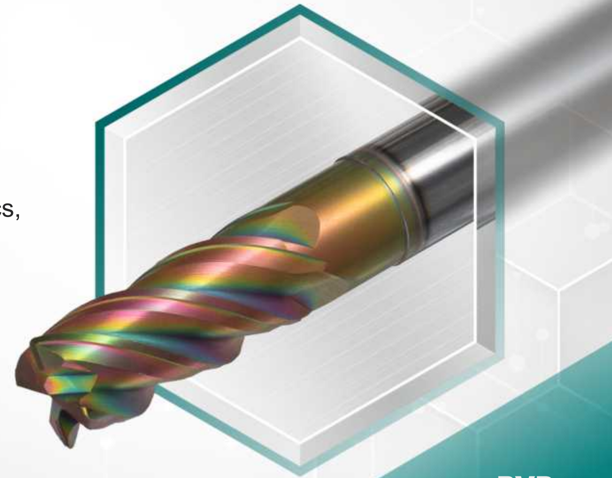
Micro-hardness (HV)	1500-2500
Thickness (µm)	2-3
Friction coefficient	0,4
Coating temperature (°C)	400
Working temperature (°C)	500
Colour	silver/golden

PVD SPECIAL COATINGS

HARDCOMP

sliding coating especially for soft materials machining and forming

drilling and milling of wood and plastics, pressing of steel, sliding and rolling elements



Basic properties

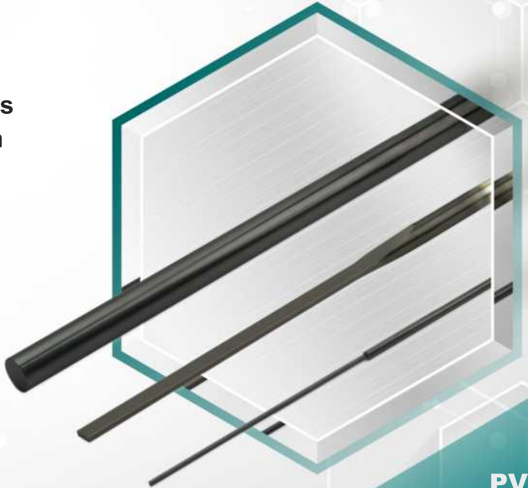
Micro-hardness (HV)	4000-6000
Thickness (µm)	1-3
Friction coefficient	0,05-0,15
Coating temperature (°C)	200
Working temperature (°C)	300
Colour	iridescent/black

PVD SPECIAL COATINGS

SILLCOMP

special coating with high hardness and very low coefficient of friction

diesel engine parts, sliding and rolling elements, machining of non-ferrous metals



Basic properties

Micro-hardness (HV)	1500-2500
Thickness (μm)	1-5
Friction coefficient	0,02-0,1
Coating temperature (°C)	180-300
Working temperature (°C)	450
Colour	black

PVD SPECIAL COATINGS

HLF COMP

duplex coating suitable for special tools and machine parts coating

milling and drilling of materials
with high hardness, sliding
and rolling elements

Basic properties

Micro-hardness (HV)	2300
Thickness (µm)	1-5
Friction coefficient	0,2
Coating temperature (°C)	450
Working temperature (°C)	350
Colour	dark grey

PVD SPECIAL COATINGS

MAXCOMP

modified coating suitable for special tools and machine parts coating

pressing of galvanized sheets,
gears and pinions, sliding
and rolling elements

Basic properties

Micro-hardness (HV)	2300
Thickness (µm)	1-5
Friction coefficient	0,2
Coating temperature (°C)	180-300
Working temperature (°C)	350
Colour	dark grey

PVD SPECIAL COATINGS

MULTICOMP

duplex coating for demanding machining of metal materials

steel milling, forming
of thick-walled steel
and stainless steel sheets

Basic properties

Micro-hardness (HV)	2500-3500
Thickness (µm)	2-6
Friction coefficient	0,4
Coating temperature (°C)	450
Working temperature (°C)	600
Colour	golden

PVD SPECIAL COATINGS

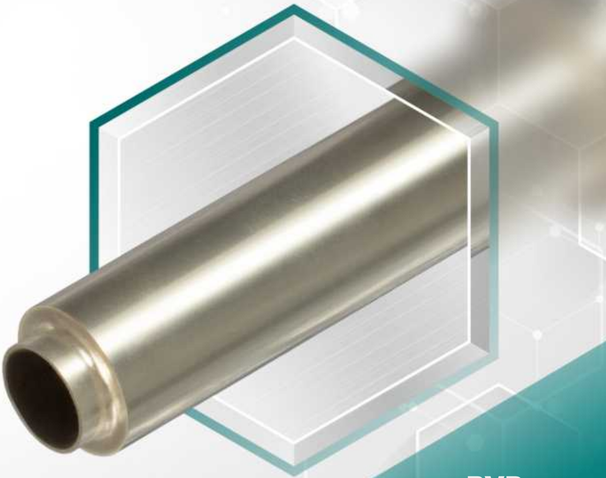
ZIRCOMP

special zirconium-based coating for machining and forming

machining of non-ferrous metals and plastics, forming of aluminium and magnesium alloys

Basic properties

Micro-hardness (HV)	1800
Thickness (μm)	1-4
Friction coefficient	0,5
Coating temperature (°C)	450
Working temperature (°C)	550
Colour	white-golden



PVD SPECIAL COATINGS

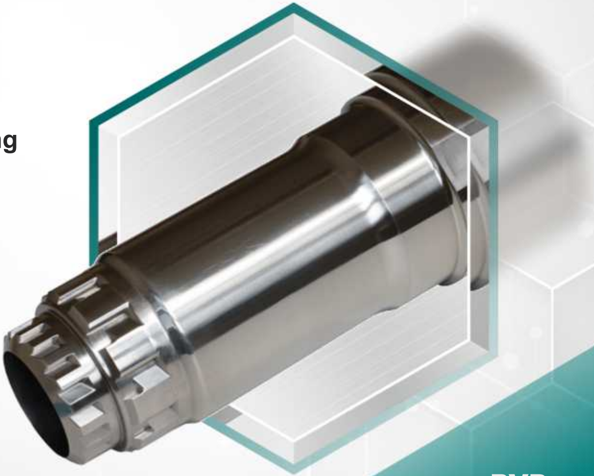
FORMCOMP

efficient coating for highly stressed cutting tools and plastics processing

machining of non-ferrous metals,
molds for plastic and rubber pressing,
molds for plastic injection

Basic properties

Micro-hardness (HV)	1600-2000
Thickness (μm)	2-6
Friction coefficient	0,5
Coating temperature (°C)	200-450
Working temperature (°C)	600
Colour	silver-grey



PVD SPECIAL COATINGS

VANCOMP

highly resistant vanadium-based coating for non-ferrous metal casting

highly stressed parts of molds for pressure casting of non-ferrous metals (aluminium, magnesium, zinc)

Basic properties

Micro-hardness (HV)	1900-2200
Thickness (μm)	2-6
Friction coefficient	0,4-0,6
Coating temperature (°C)	450
Working temperature (°C)	900
Colour	silver-grey

PVD SPECIAL COATINGS

ADDITIONAL SERVICES

- → **de-coating** – removal of old coatings (our own or competitor's) from tool steels and carbides without affecting the basic material of the tools
- → **micro-sandblasting** – removal of mechanical impurities from the surface of the tools using fine corundum sand
- → **wet sandblasting** – removal of mechanical impurities from the surface of the tools using a mixture of very fine corundum sand and water
- → **polishing** – reduction of surface roughness before and after coating
- → **plasma nitriding** – saturation of the tool surface with nitrogen in a high-current glow discharge
- → **annealing** – reduction of internal stresses, especially in molds
- → **cutting tool edge analysis** – very precise measurement of geometry (roundness, angle), surface condition
- → **transport** – own collection service
- → **consultancy** – design of a coating for a given application, recommendation of a suitable material for tool production