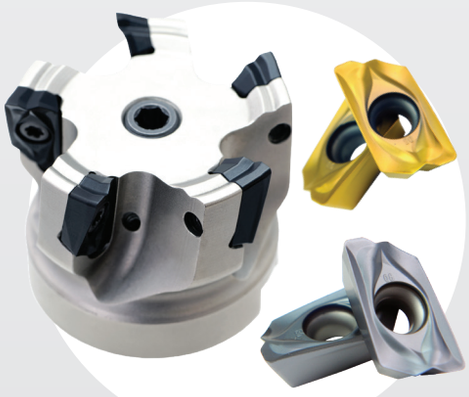
Primus Vietnam

PVD Coating for Cutting Tools



We listen understand deliver

Coating Portfolio

Performance Coatings

Coating	Composition	Hardness	Thickness	Color	Structure	Oxidation Temperature	Surface Roughness (Ra)	Co
TiN*	TiN	30 GPa	2.5 ~ 3 µm	Gold	Monolayer	500° C	0.15 ~ 0.30	
TiCN	TiCN	35 GPa	2.5 ~ 3 µm	Grey	Multilayer	400° C	0.10 ~ 0.20	
Drilling	AlTiN	37 GPa	2.2 ~ 3.2 µm	Violet	Multilayer	800° C	0.15 ~ 0.30	
CrN*	CrN	23 GPa	2 ~ 3 µm	Silver	Monolayer	700° C	0.15 ~ 0.30	
ZrN	ZrN	23 GPa	2 ~ 3 µm	Silver Gold	Monolayer	600° C	0.15 ~ 0.30	

* Available in Low Temperature.

High Perfomance Coatings

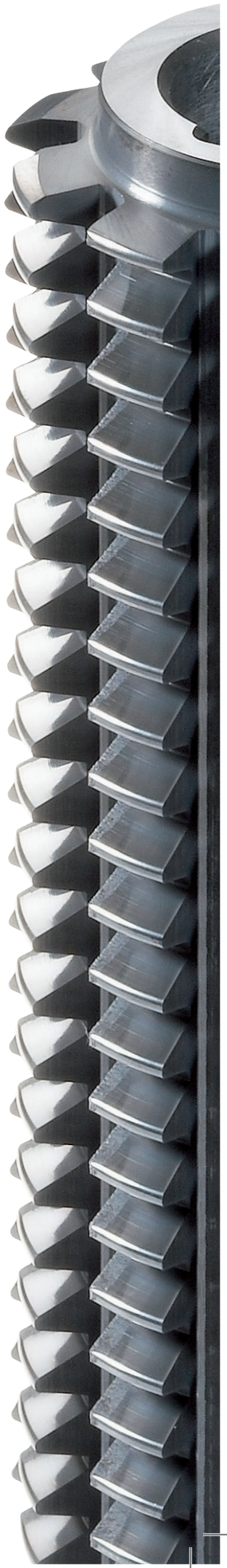
Coating	Composition	Hardness	Thickness	Color	Structure	Oxidation Temperature	Surface Roughness (Ra)	Co
HP Drilling	AlTi Based	37 GPa	2.2 ~ 3.2 µm	Violet	Multilayer	800° C	0.15 ~ 0.30	
HP Milling	AlTiCr Based	38 GPa	2 ~ 3 µm	Grey-Violet	Gradient Layer	900° C	0.10 ~ 0.25	
HP Dura	AlCr Based	38 GPa	2 ~ 3 µm	Dark Grey	Multilayer	1,100° C	0.10 ~ 0.25	
HP Vicious*	AlTiSi Based	41 GPa	2 ~ 3.2 µm	Red-Brown	Nanolayer	1,100° C	0.10 ~ 0.25	
HP Cera*	Cr Based	30 GPa	2.5 ~ 3.5 µm	Dark Grey	Multilayer	550° C	0.04 ~ 0.10	
HP Aero	AlTiCr Based	30 GPa	2 ~ 3 µm	Silver	Multilayer	700° C	0.10 ~ 0.20	
HP Alu	Equivalent to TiB2	28 GPa	1.5 ~ 2 µm	Silver	Multilayer	500° C	0.04 ~ 0.10	

* Available in Low Temperature.

PrimusCoating

ess	Coefficient of Friction	Coating Deposition Temperature	Properties	Applications
	0.25	450º C 220º C	Multi-purpose, favorable adhesion to steels in general and carbide. Chemical stability.	Turning, general machining.
	0.25	450º C	Multi-purpose, if higher toughness and lower friction required. Excellent lubricity for threading process.	Tapping all materials, machining stainless steel and aluminum
	0.4	450º C	High heat resistance and hardness. Favorable adhesion on carbide.	Continuous cut, drilling, turning, high speed machining, cast iron.
	0.4	450º C 250º C	High adhesion, very high corrosion resistance. Excellent de-molding properties.	Plastic injection molding, forming of low strength metal sheets.
	0.4	450º C	Excellent corrosion and wear resistance. Resistant against abrasive wear.	Machining aluminium alloys, titanium and non-ferrous materials. Suitable for polymer materials. Punching and metal forming, reducing galling process.

ess	Coefficient of Friction	Coating Deposition Temperature	Properties	Applications
	0.35	450º C	High toughness and low friction.	High Performance and High speed drilling in cast iron and alloyed steel up to 54HRC. Suitable for deep hole.
	0.33	450º C	High heat resistance and high abrasion resistance.	High speed, semi-dry/dry milling of cast iron and alloyed steel up to 54HRC.
	0.33	450º C	High temperature oxidation resistance. Good for machining high hardness materials.	High efficiency milling, high speed machining for gear generation, dry/wet machining.
	0.3	450º C 380º C	Very high heat resistance and high brasion resistance.	Milling and drilling high hardened steels from 54HRC to 60HRC. Suitable for dry/wet machining.
	0.1	450º C 250º C	High toughness, low friction coefficient and friction wear resistance, excellent sliding properties.	Machining of aluminum alloys and non ferrous materials. Plastic Injection.
	0.25	450º C	High toughness, low friction.	Machining of high tensile strength materials, Ti and Ni based alloys, stainless steel.
	0.1	450º C	Anti-galling, low friction.	Machining of aluminum alloys (high and low Si content).



PVD COATING FOR CUTTING TOOLS

Our PVD coatings were specially developed to reduce friction, increase surface hardness, increasing tool life, in different applications and working conditions.

With over 30 years of experience of coating cutting tools, our R&D center has been developing high performance coatings dedicated to all machining applications.

Our coatings are divided in two series: Performance and High Performance, each with specific characteristics, processes and most recommended applications.

RECOMMENDATION BY APPLICATION

	Recommendation by application							
	Drilling		Milling		Threading		Turning	Gear generation
	HSS	Carbide	HSS	Carbide	HSS	Carbide		
Mild Steel / Alloy Steel / Carbon Steel / Tool Steel (up to 40HRC)	**Drilling**	**HP Drilling**	**Drilling**	**HP Dura**	**TiCN**		**TiN**	**HP Dura**
	TiN	Drilling	TiN		TiN / Drilling		Drilling	
Hardened Steel (up to 54HRC)	**N/A**	**HP Drilling**	**N/A**	**HP Dura**	**HP Dura**		**HP Dura**	**HP Vicious**
					TiCN		Drilling	HP Dura
Hardened Steel (up to 60HRC)	**N/A**	**HP Vicious**	**N/A**	**HP Vicious**	**HP Dura**		**HP Vicious**	**HP Vicious**
Stainless Steel (SUS)	**HP Drilling**	**HP Aero**	**Drilling**	**HP Aero**	**TiCN**		**HP Aero**	**HP Dura**
	Drilling			HP Dura	TiN / Drilling			HP Vicious
Cast Iron	**HP Dura**		**HP Dura**		**TiCN**		**Drilling**	**HP Dura**
	Drilling				TiN / Drilling		TiN	HP Vicious
Aluminum High Si (Si < 12%)	**HP Cera**		**HP Cera**		**HP Cera**		**HP Alu**	**N/A**
	HP Alu		HP Alu		TiCN			
Titanium Alloys, Nickel Alloys, Heat Resistant Alloys	**N/A**	**HP Aero**	**N/A**	**HP Aero**	**TiCN**		**HP Aero**	**HP Dura**
		HP Drilling		HP Drilling	TiN / Drilling			HP Vicious
Cooper Alloys, Brass, Bronze	**HP Cera**		**HP Cera**		**HP Cera**		**HP Alu**	**N/A**
	HP Alu		HP Alu		TiCN			

PrimusCoating

Primus Vietnam LLC
Factory Address: C_1B_C6_B, Lot C_1B_CN
My Phuoc 3 Industrial Park, Thoi Hoa Ward
Ben Cat Town, Binh Duong Province - 75951 Vietnam
Tel.: +84 93 677 52 27
hoang.cuong@primusvietnam.com
www.primusvietnam.com

We listen understand deliver

www.primuscoating.com

PV-1123-GCCT

PRIMUS VIETNAM