INOVAP – Hard Coatings, Coating Types and Recipes

For tools out of HSS, Solid Carbide, Carbide Metal and Cermet

PVD Hard Coating		Hardness[2)]	Thickness[3)]	Deposition temperature	Coefficient of friction	Application temperature	Colour
Type	Recipe[1)]	HV0,001	µm	°C	on steel	°C	
TiN	TiN257	2.400	2,0	380 - 420	0,4	300-600	Golden yellow
TiCN	14TiCN	2.800	2,0	380 - 420	0,2 - 0,3	300-450	Silver grey
TiAlN	31TiAlN	3.100	2,0	380 - 420	0,3	900	Dark blue
TiAlCN	37TiAlCN	3.200	2,0	380 - 420	0,2	900	Copper cyan
CrN	20CrN	1.900	2,0	380 - 420	0,3	700	Silver grey
SHC®	51SHC	> 4.000	2,0	100 - 200	0,2	400	Black grey

[1)] All recipes work with the proven dc pulsed-arc method and a fine multilayer structure, therefore more adhesive strength, harder and smoother

[2)] Vickers hardness measured with nanoindentation, 0,01 N normal force

[3)] Other thickness upon request

INOVAP

Innovative Vakuum- und Plasmatechnik

www.inovap.de

INOVAP – Hard Coatings, Applications and Profit

For tools out of HSS, Solid Carbide, Carbide Metal and Cermet

Type	Recipe	Application temperature	Typical Application	Preferred machinable materials	Specialities	Colour
TiN	TiN257	300 - 600 °C	Drilling, milling, cutting, forming, decoration	Universal	Reasonable	Golden yellow
TiCN	14TiCN	300 - 450 °C	Milling, drilling, thread cutting, stamping, forming, decoration	Steel, high-tensile materials, Inconel, ideally for HSS millings	Broken cuts and dry machining	Silver grey
TiAlN	31TiAlN	300 – 900 °C	Milling, dry cutting, cast machining, high cutting speed	High and low alloyed steel, grey cast iron, AlSi und Ni alloys	Broken cuts and dry machining	Dark blue
TiAlCN	37TiAlCN	300 – 900 °C	Hard material machining	Strong machinable materials (Ti alloys, hardened steel etc.)	Hard material machining	Copper cyan
CrN	20CrN	300 – 700 °C	cutting, synthetic material, forming, decoration, wood	Non-ferrous metals, esp. Al, Ti and Cu-alloys, wood	Slippage, decreased agglomerates	Silver grey
SHC®	51SHC	100 – 400 °C	Non-ferrous machining, forming, slip coating	Al, GFK and CFK, Graphite, non-ferrous metals, wood	Non-ferrous machining, composites	Black grey

Profit: higher cutting speed, higher life time, better surface quality, decreased agglomerates, saving cooling lubricants, lower actuation forces, better demolding, optical upgrading

INOVAP

Innovative Vakuum- und Plasmatechnik

www.inovap.de