













# Surface Processing Comparison Table

Coating type	PVD										CVD		
	ZERO- I	S-PVD	TiN	TiAlN	CrN	TiCN	TH	AT	TC	DLC	TiC	TiCN	
Fields of application	Pressing molds Punching molds	Pressing molds Press dies Shrink-fit dies	Cutting tools Light electrical components Automobile components Accessories	Ultra-hard cutting tools Press dies Shrink-fit dies Pressing molds	Molds for SUS processing Automobile components Light electrical components Die cast pins	Pressing molds Press dies Shrink-fit dies Cutting tools	Ultra-hard cutting tools High-speed cutting tools Punching molds	Pressing molds Drawing molds Cutting tools	Pressing molds Drawing dies Molds for SUS processing	Aluminum molding molds High-speed cutting tools Aluminum cutting tools Automobile components	Pressing molds Drawing molds Ultra-hard tools	Drawing molds Die cast pins Ultra-hard tools	
Coating hardness (Hv)	3,500	2,600	2,300	3,000	1,500	2,800	3,600	3,000	2,900	4,000	3,000	2,500	
Oxidation resistance temperature (°C)	1,000	550	550	800	650	400	1,100	1,100	900	300	400	550	
Friction coefficient	0.6	0.45	0.45	0.55	0.5	0.4	0.8	0.6	0.4	0.2	0.55	0.4	
Processing temperature (°C)	500°C or lower	500°C or lower	500°C or lower	500°C or lower	500°C or lower	500°C or lower	500°C or lower	500°C or lower	500°C or lower	500°C or lower	200°C or lower	Near 1,000°C	Near 1,000°C
Approximate film thickness (μm)	4-6	4-6	2-4	1-5	2-5	2-5	3-5	2-4	2-5	1-1.5	2-5	4-10	
Color tone	Black gray	Gold	Gold	Purple	Gray	Tan	Brass yellow	Black gray	Gray	Black	Silver	Gold	
													
Abrasion resistance	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	
Heat resistance	◎	○	○	◎	○	○	◎	◎	◎	△	○	○	
Corrosion resistance	○	△	△	○	○	△	○	○	○	△	○	○	
Dimensional accuracy	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	△	△	
Release characteristics	○	○	○	○	◎	○	○	○	◎	◎	○	○	
Possibility of Coating Off	WC × Steel ○	WC × Steel ○	WC × Steel ○	WC × Steel ○	WC × Steel ○	WC × Steel ○	Not possible	WC × Steel ○	Not possible	○	WC × Steel ○	WC × Steel ○	
Representative material types	WC SKH SKD	WC SKH SKD SUS	WC SKH SKD SUS	WC SKH SKD SUS	WC SKH SKD SUS	WC SKH SKD SUS	WC	WC SKH SKD	WC SKH SKD SUS	WC SKH SKD SUS SK SKS	WC SKH SKD	WC SKH SKD	

Note: The values above are only indicative, and are based on test pieces. They are subject to change based on the properties of the parent material, the shape of the product, the amount of processing, and so on. The above values are not guaranteed values. For cold die steel and martensitic stainless steel, perform high-temperature annealing should always be performed.



# Heat Resistance Temperature

