

# **PVD Coatings for Stamping and Forming**



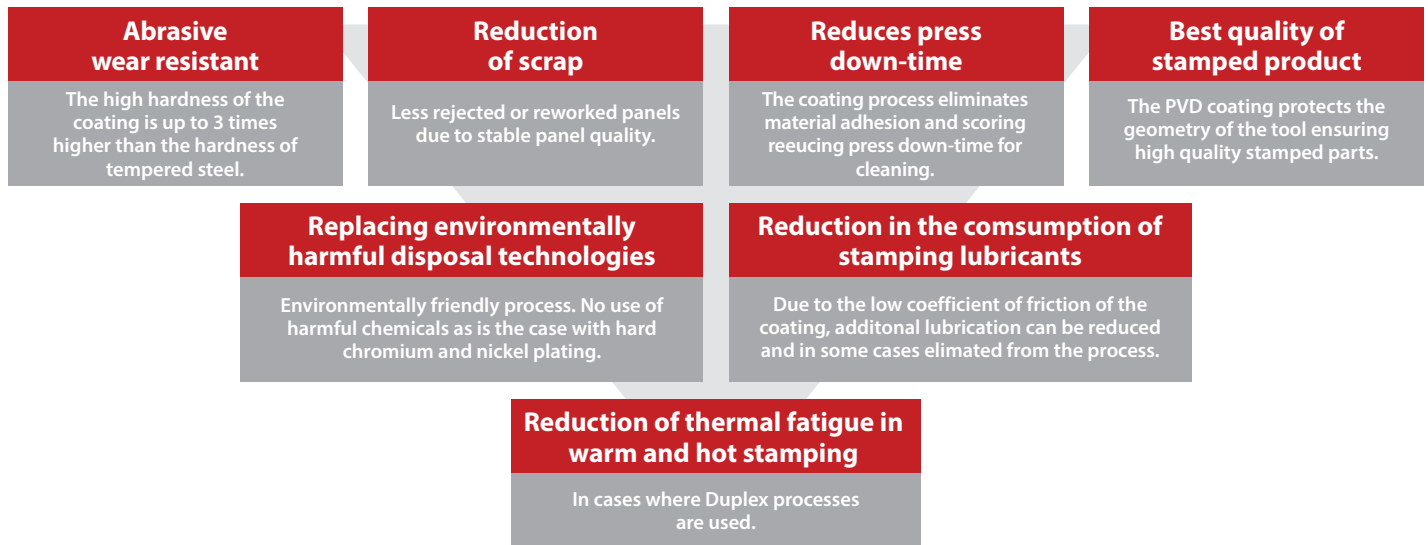
# PVD Coatings for Stamping and Forming

Our PVD coatings are specifically designed to reduce friction, reduce galling, scoring and material adhesion. Especially in medium to high strength material forming applications.

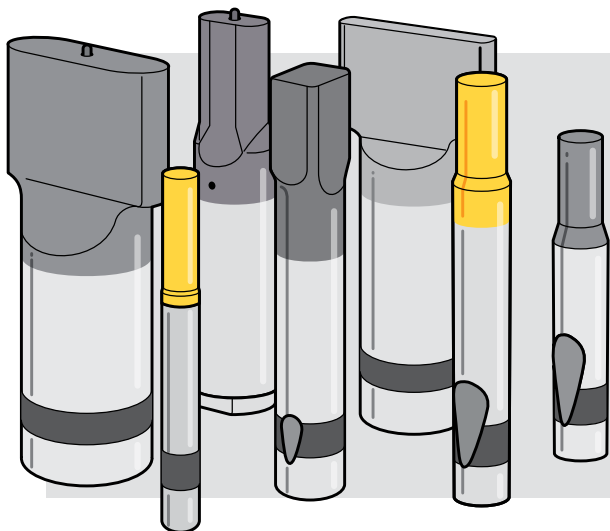
With over 30 years of experience in the segment, our R&D center is continuously developing and improving high-performance coatings dedicated to molds and dies.



## Benefits of PVD Coating in the Stamping Process



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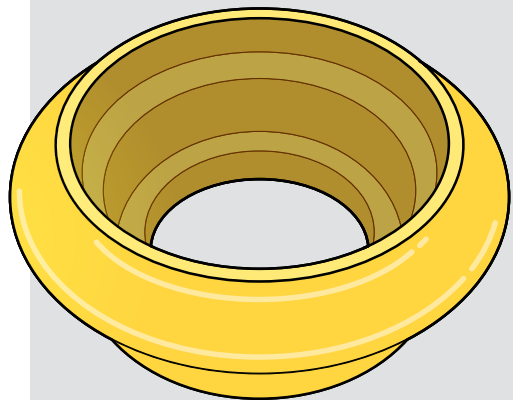
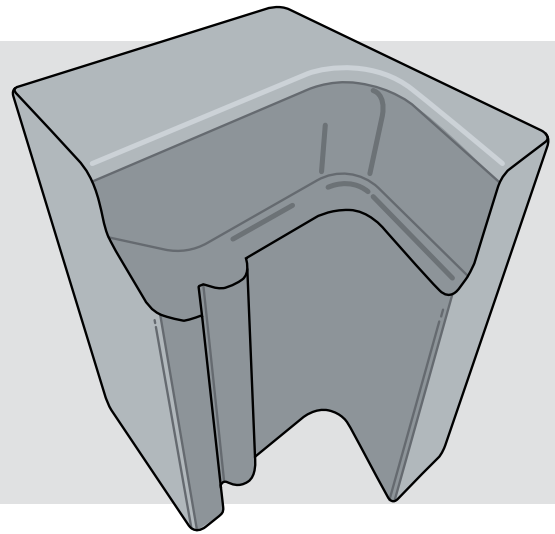


### Piercing, Trimming and Fine Blanking Tools

- Longer punch life.
- Greater dimensional reliability in the process.
- Eliminates material adhesion to the punch surface.
- Reduce punching forces on the tool.

## Sheet Forming Dies

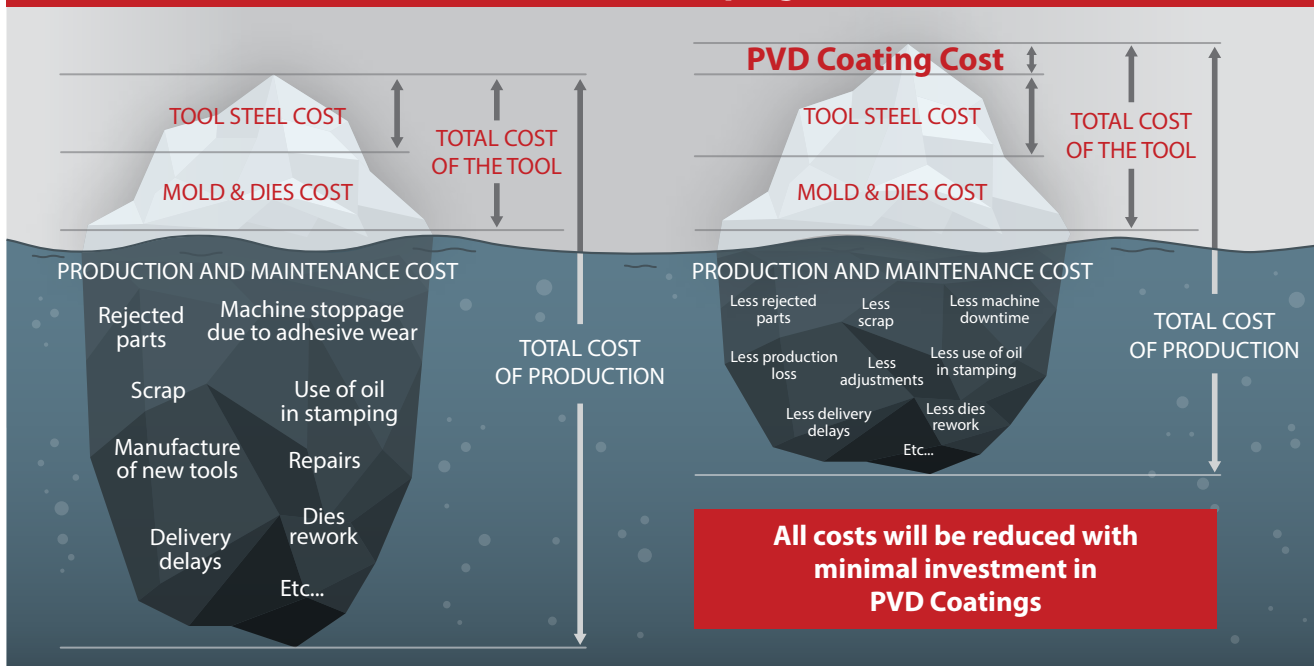
- Less oil consumption during production.
- Improved quality of the stamped item.
- Less scoring and cold welding on the tool.
- Enables forming of Advanced High Strength Steel material.



## Aluminum Forming

- Eliminates aluminum adhesion to tool surface during the manufacturing process.
- Increased productivity.
- Longer tool life.
- Reduces the use of lubrication oil in the forming process.
- Less machine downtime for maintenance and tool change.

## Hidden Cost of Stamping Process



## Specifications of Coating for Stamping and Forming Molds and Dies

Coating Features	TiN	HP Fama*	HP Form*	HP Dura*	HP Cera*
Composition	TiN	TiC Based	TiAlN Based	AlCr Based	Cr Based
Hardness (GPa)	30 GPa	35 GPa	37 GPa	38 GPa	30 GPa
Coefficient of Friction* (dry against steel)	0.25	0.25	0.4	0.33	0.1
Coating Thickness (µm)	2 ~ 4 µm	4 ~ 6 µm	4 ~ 6 µm	4 ~ 6 µm	1.5 ~ 2 µm
Maximum Oxidation Temperature (°C)	500°C	400°C	850°C	1,100°C	550°C
Coating Deposition Temperature (°C)	450°C	450°C	450°C	450°C	450°C
Coating Color	Gold	Grey	Violet	Dark Grey	Dark Grey
Coating Structure	Monolayer	Multilayer	Multilayer	Multilayer	Multilayer

If pre-polishing is required, please contact our sales department or sales@primuscoating.com

\* Duplex coating available (Nitride + Coating). For more information, please contact our sales department or sales@primuscoating.com  
The depth of nitride will depend on the material of the mold.

## Indicated Applications

Material			Recommended Coatings														
Group	Subgroup	Plate Thickness	Forming				Cut				Fine Cut				Drawing		
			Die		Punch		Die		Punch		Die		Punch		Die	Punch	
			○	⊙	○	⊙	○	⊙	○	⊙	○	⊙	○	⊙	○	⊙	
Steels	Carbon Steel	0 ~ 3mm	HP Fama	HP Form	HP Fama	HP Dura	HP Fama	HP Dura	HP Form	HP Dura	HP Fama	HP Form	HP Fama	HP Form	-	-	
		> 3 mm	HP Fama Duplex	HP Dura Duplex	HP Fama Duplex	HP Form Duplex	HP Fama	HP Dura	HP Form	HP Dura	HP Dura	-	HP Dura	-	-	-	
	SAE 1035 • 1045 • 1050 • 1050 • 1070 • 1090	0 ~ 3 mm	HP Fama Duplex	-	HP Fama Duplex	HP Dura Duplex	HP Fama	HP Dura	HP Form	HP Dura	HP Dura	-	HP Dura	-	-	-	
		> 3 mm	HP Fama Duplex	-	HP Fama Duplex	HP Dura Duplex	HP Fama	HP Dura	HP Form	HP Dura	HP Dura	-	HP Dura	-	HP Fama Duplex	HP Dura Duplex	
	Advanced High Strength Steels	DP, CP, FP • TRIP	0 ~ 3 mm	HP Fama Duplex	HP Dura Duplex	HP Fama Duplex	HP Dura Duplex	HP Fama	HP Dura	HP Form	HP Dura	HP Fama	-	HP Dura	-	HP Fama Duplex	HP Dura Duplex
			> 3 mm	HP Fama Duplex	HP Dura Duplex	HP Fama Duplex	HP Dura Duplex	HP Fama Duplex	HP Dura Duplex	HP Form Duplex	HP Fama Duplex	HP Fama	-	HP Dura	-	HP Fama Duplex	HP Dura Duplex
Stainless Steel	200 • 300 • 400	All Thicknesses	HP Fama Duplex	-	HP Fama Duplex	-	HP Fama	HP Dura	HP Fama	HP Dura	N/A	-	N/A	-	HP Fama Duplex	HP Dura Duplex	
Aluminum	All	Aluminum-Manganese / Aluminum Magnesium / Aluminum-Magnesium-Silicon / Aluminum-Zinc	All Thicknesses	HP Cera	HP Fama	TiN	HP Cera	TiN	HP Dura	TiN	HP Dura	N/A	-	N/A	-	HP Fama Duplex	HP Dura Duplex
Copper	All	Aluminum Copper, Silicon Copper and Beryllium Copper	All Thicknesses	HP Fama	HP Cera	HP Cera	HP Fama	HP Dura	-	HP Dura	-	N/A	-	N/A	-	HP Fama	HP Cera

⊙ Excellent ○ Good

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