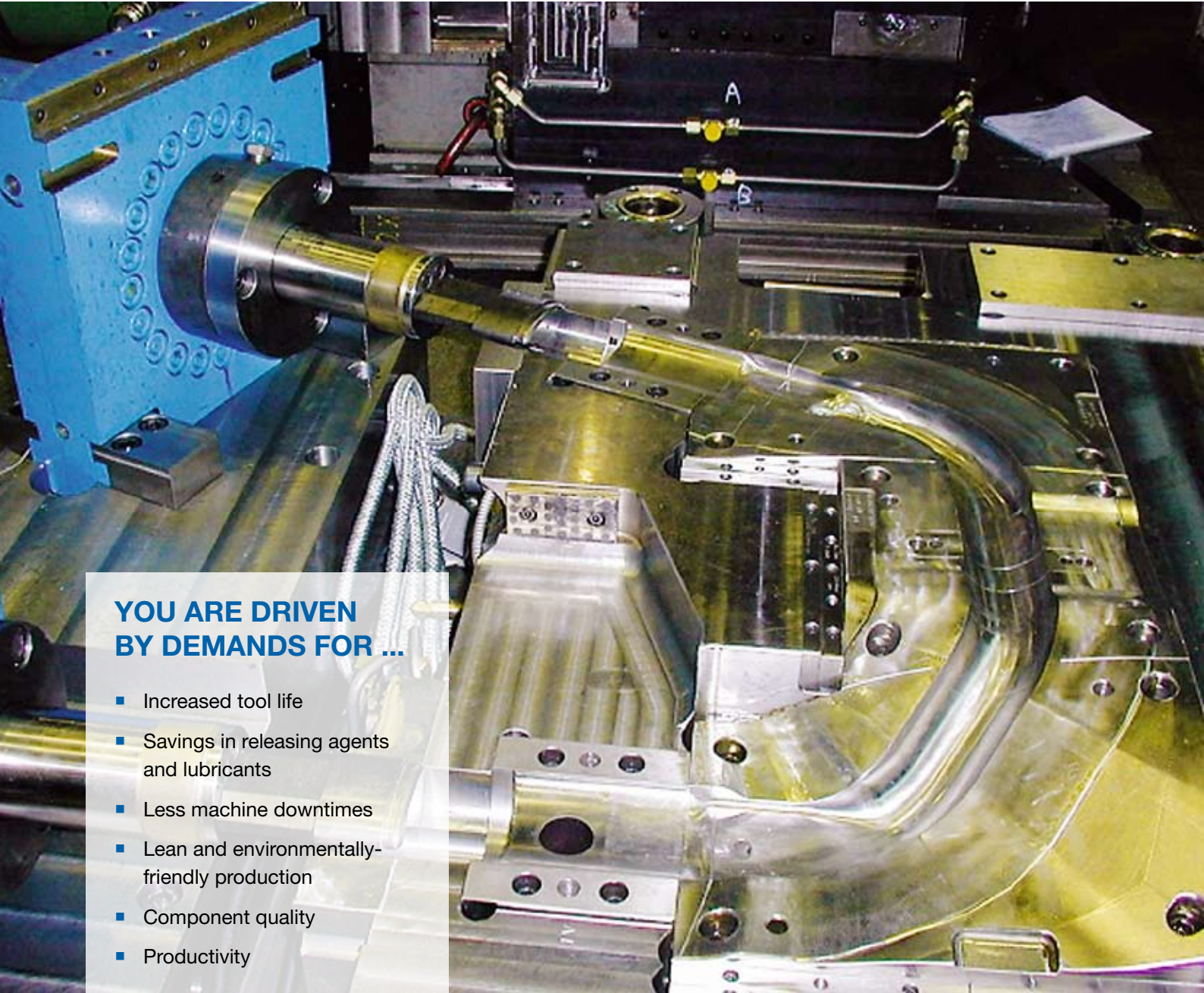


Surface Solutions for Efficient

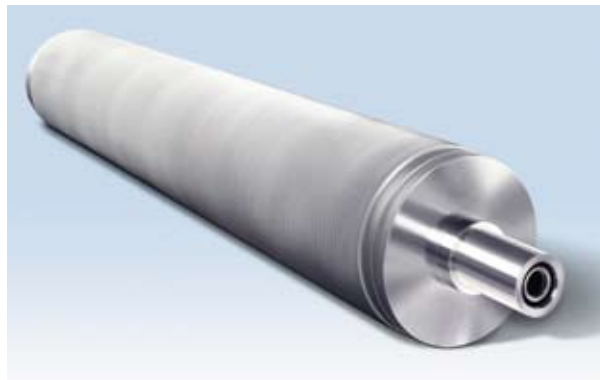
Forming



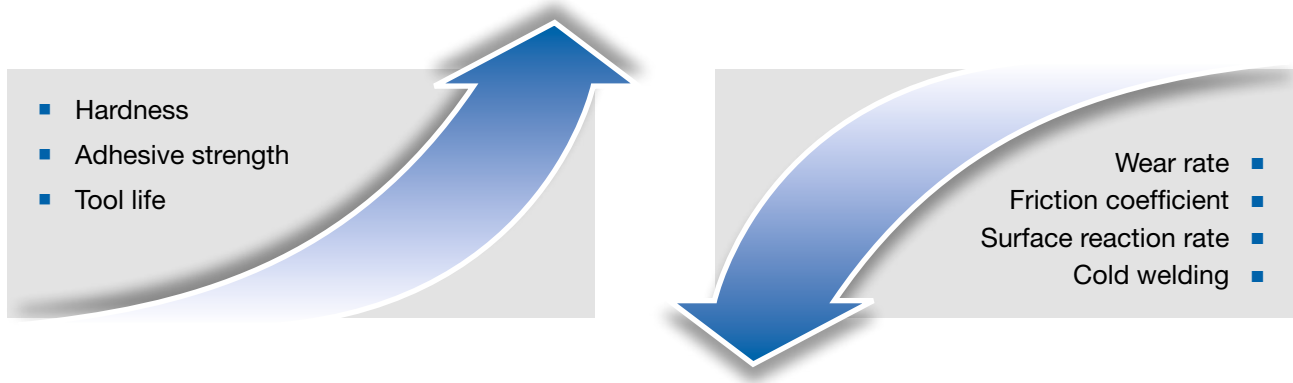


YOU ARE DRIVEN BY DEMANDS FOR ...

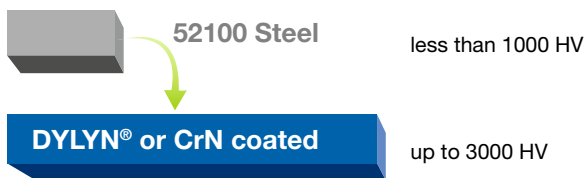
- Increased tool life
- Savings in releasing agents and lubricants
- Less machine downtimes
- Lean and environmentally-friendly production
- Component quality
- Productivity



Instant Benefits through Custom Coatings



Higher Hardness



Lower Friction Coefficient

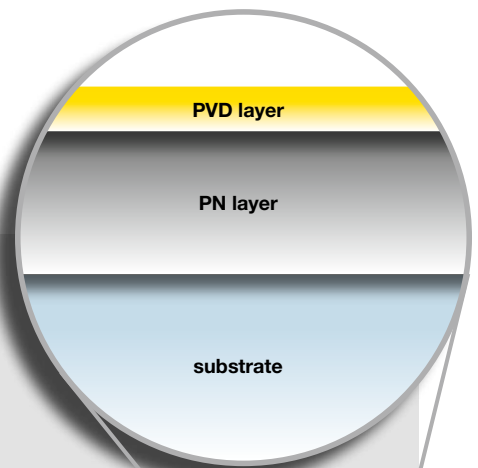


The majority of forming tools are still refined with PVD coatings using standard ARC technology.

With the increasing significance of aluminium forming, DLC technology

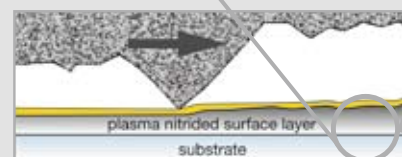
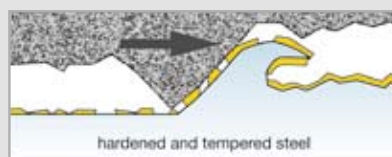
has become ever more relevant. Certain applications such as hot forging, benefit massively from Combi Treatment (plasma nitriding and PVD). This treatment may be run in one single or two separate

processes. The model below illustrates a surface refined with Combi Treatment.



Technology Focus: Combi Treatment

- Substitution of expensive materials
- Targeted optimisation of tool and component properties
- Significantly longer tool life
- Flexible options based on diversity of coating solutions



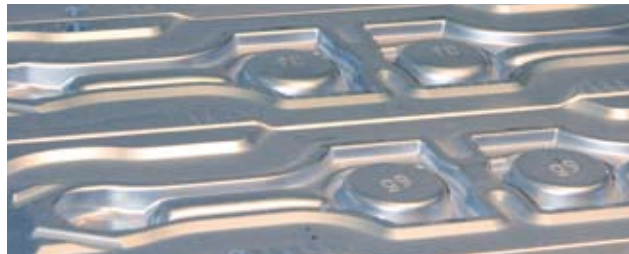
The comparison shows: A plasma nitrided surface considerably improves the supporting effect for the PVD coating.

Thin Film Coatings for Forming – Specifications and Properties

Coating	Composition	Colour	Hardness (HV)	Friction Coefficient	Working Temp. (°C)	Recommended Applications	Plasma Nitriding Recommended
<i>F_{fusion}</i>	VXN	White gold	2200	0.3	650	Aluminium die casting	
TiN	TiN	Gold	2500	0.3	700	Sheet forming	
TiCN	TiCN (monolayer, gradient, multilayer)	Grey, copper	3000	0.3	500	Sheet forming	
DLC	DYLYN®/DLC A	Black	3000	0.15	300	Aluminium forming	
W-C:H	W-C:H (on hard coatings)	Black	1000–1500	0.15	350	Sheet forming, massive forming, hydroforming	yes
CrN	CrN	Steel grey	2300	0.35	650	Sheet forming, massive forming, hydroforming	yes
CrNmulti	CrN (multilayer)	Steel grey	2500	0.35	650	Die casting, moulds	yes
CrNmod	CrN (multilayer with toplayer)	Rainbow	2500	0.3	700	Aluminium and austenitic steel for sheet forming, massive forming	yes



Forming



Primary shaping

- Cold forming
- Hydroforming
- Stamping
- Massive forming
- Rolling/pressure forming
- Embossing
- Bending
- Cupping or drawing
- Blanking
- Coining
- Forging
- Pressure die casting
- Pressing
- Molding

Crucial Competitive Advantages

The various applications within this diverse segment have at least two things in common: Their users especially rely on a long service life of the tools and on saving release agents as well as lubricants.

Coating properties such as wear resistance, low friction, oxidation resistance, minimising cold welding etc., cater to the main demands in these industries.

Our handling expertise for all kinds of parts, even very large or heavy parts, completes the performance portfolio.

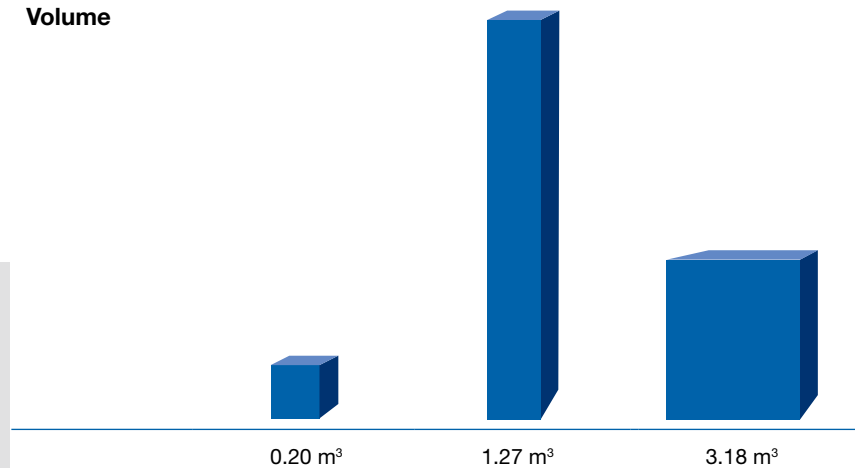
Our Triangle of Benefits



Unique Capacities

	Conventional PVD system	System for	
		Long parts	Big parts
Diameter	■ 600 mm	■ 600 mm	■ 1,500 mm
Height	■ 700 mm	■ 4,500 mm	■ 1,800 mm

Volume



WHAT CAN WE DO FOR YOU?

- Standard and custom coating solutions
- International presence and logistics for job coating:
 - Regional pick-up and delivery service
 - Experienced, qualified staff
 - Short reaction time through 24-hour operation
 - Web based order tracking
 - Preparation, pre-treatment, post-treatment
- Expertise transfer: consulting and training
- Cutting-edge thin film equipment
- Individual Shop-in-Shop concepts



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The marked locations are specialized in handling and coating parts for the forming industry.

Sulzer Metco Thin Film

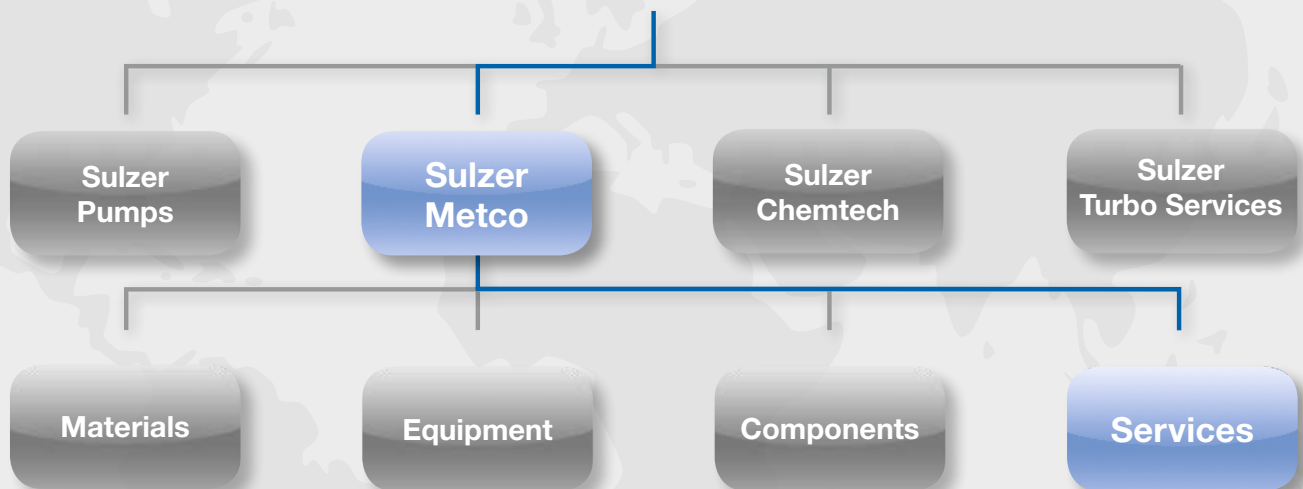
The company stands for many decades of coating expertise within the entire process chain – both in coating services and in thin film equipment. Under the umbrella of the the Sulzer Group, established in 1834 and based in Winterthur (Switzerland), the divisions are global leaders in their respective markets.

The division Sulzer Metco coats and refines surfaces. As part of this division, the Business Unit Services guaran-

tees the expertise of Sulzer Metco as a solution provider of surface coatings worldwide.

New employees, new locations and constant innovations expand and strengthen our development, production and service network so that we are closer to customers and can respond faster. The headquarters of Sulzer Metco Thin Film are located in Bergisch Gladbach near Cologne, Germany.

SULZER



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