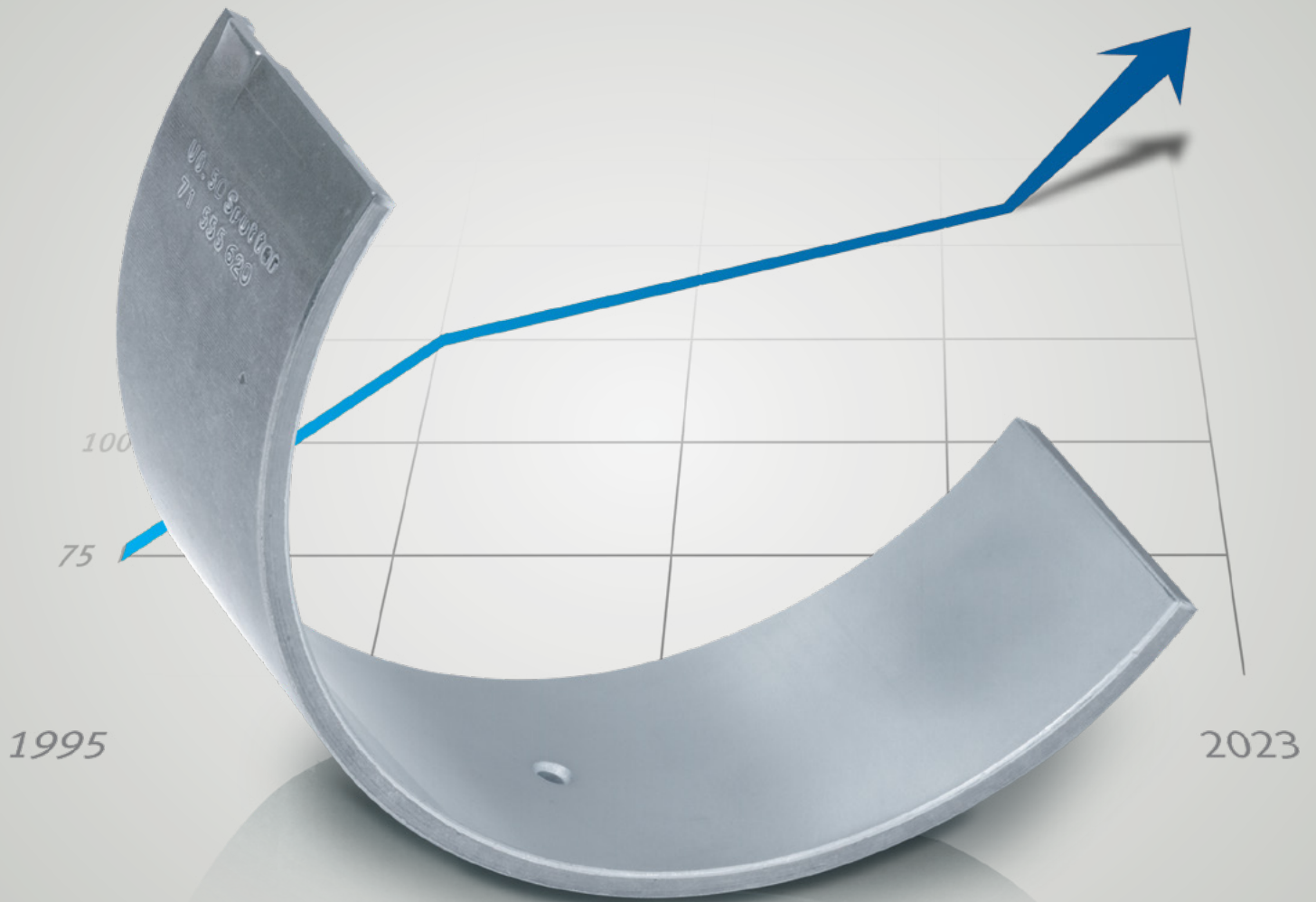




KOLBENSCHMIDT



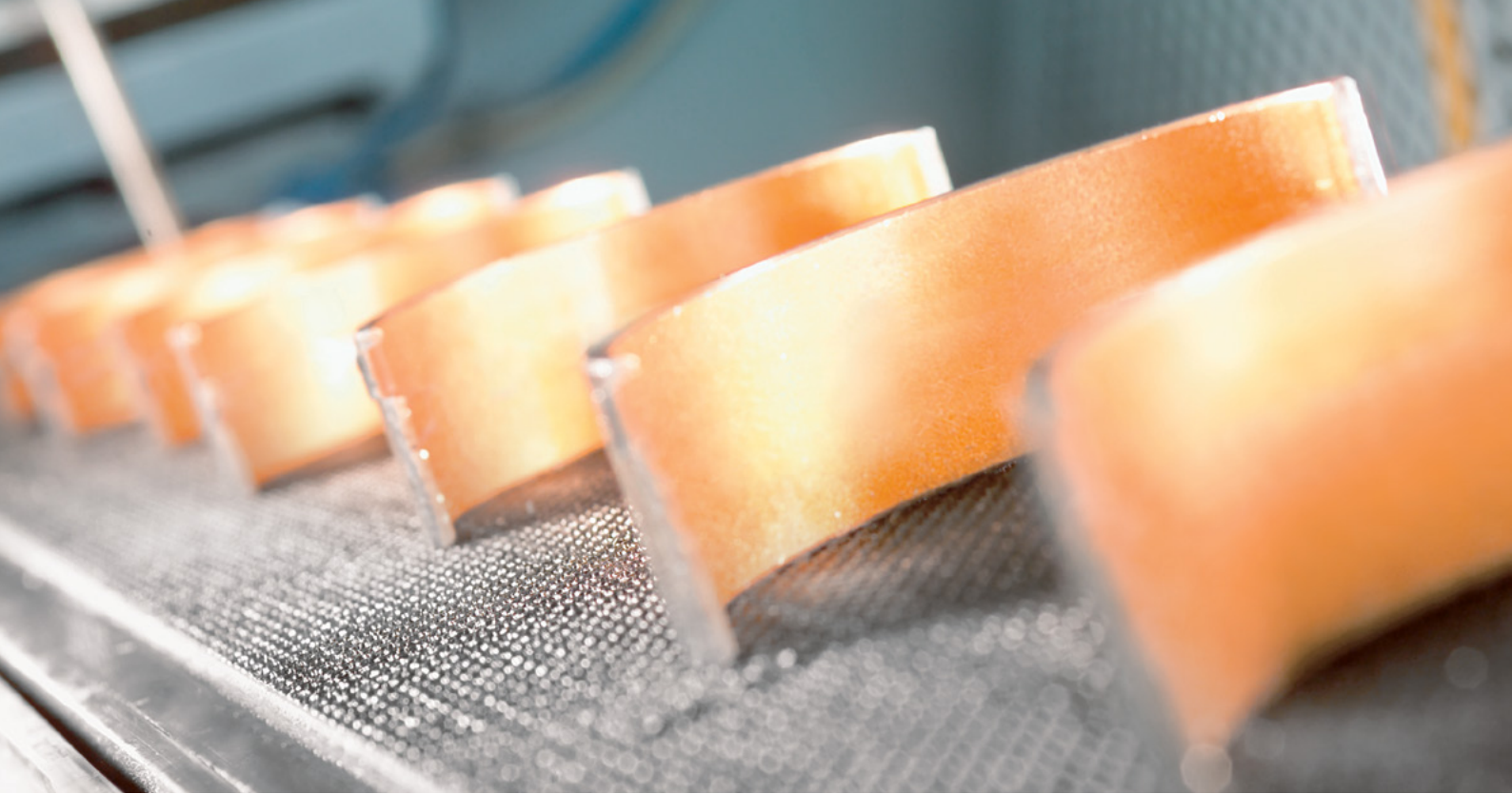
PRODUCT KNOWLEDGE

SPUTTER BEARINGS –
THE PRESSURE RISES

TAKING RESPONSIBILITY IN A CHANGING WORLD



RHEINMETALL



KOLBENSCHMIDT SPUTTER BEARINGS. QUALITY THAT RESISTS PRESSURE.

Engine construction has to stand up to various challenges. On the one hand the fuel consumption is to be further reduced, while at the same time the aim is to achieve higher performance and sportier features for passenger car engines. The engine concepts developed in response to these requirements have direct injection and turbo-charging which lead to “rising pressure”.

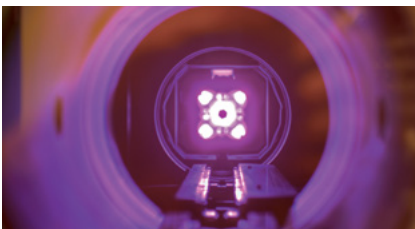
In modern turbo diesel engines, the connecting rod and main bearings can be exposed to combustion pressures of over 200 bar. With such working pressures, the stress limit of conventional two- and three-component bearings is exceeded: high-performance bearings – so called sputter bearings – are used.



Basic material: The high-grade materials used in three-component bearings.



PVD process: Magnetron coating.



Internal space of sputter system: The top layer of the bearing shells is refined with the aid of gas ions in a high vacuum.



Quality inspection: Assurance of the high Kolbenschmidt standard.

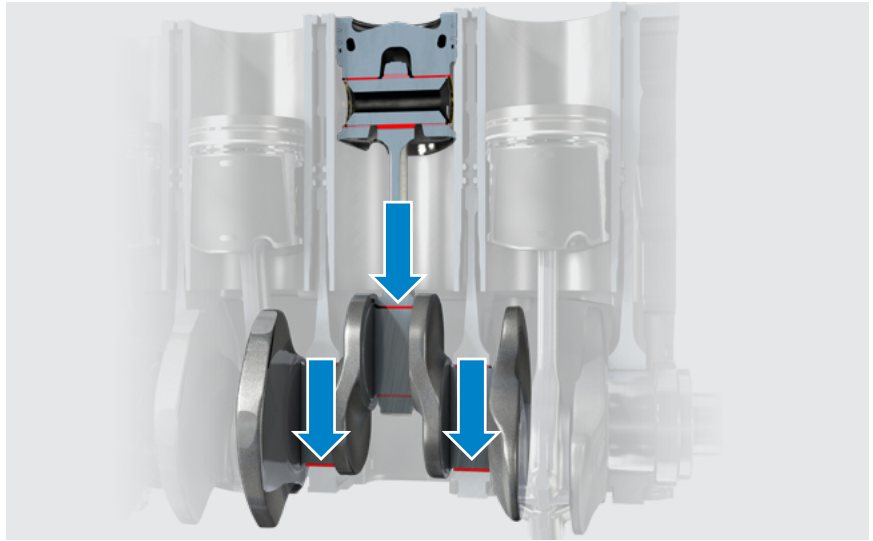
PVD process (Physical Vapour Deposition)

Finest particles are ejected from a distributor in high vacuum. By means of electromagnetic fields they are applied uniformly to the part to be coated. These magnetron layers are characterised by the finest distribution of the individual microstructural constituents.

The sputtered sliding layer can withstand the extreme strains of modern engines where fatigue and wear are concerned.

This is where the pressure builds up

The pressures that build up during combustion are transferred via the connecting rod directly to the surface of the shell of the conrod and main bearings. Higher engine performances require modern materials with a significantly higher fatigue strength, lower wear rates in the mixed friction area, and good corrosion resistance at high temperatures, in particular for the conrod bearings. Sputtered bearing shells are used at the bearing positions in the engines where there is the highest stress. In most cases, the mating shells are proven three-component bearings. On the conrod bearing, the sputter bearing is usually fitted at the conrod side (top). On the main bearing, the lower half is sputtered.



The conrod and main bearings of modern engines with direct diesel injection must withstand a surface pressure of up to 120 N/mm².

Find the suitable sputter bearing

The correct assembly position of the sputtered bearing shell is one of the prerequisites for assuring operational safety and a long service life. To achieve this, please observe the direction of the arrow in the product range of the Kolbenschmidt Engine Bearings catalogue. Kolbenschmidt sputter bearings are marked with “SPUTTER” on the back to distinguish between the two bearing shells.



NOTE

In the Kolbenschmidt Engine Bearings catalogue, the Kolbenschmidt sputter bearings are marked with an “SPUTTER” in column 2. The assembly position is shown by the arrow in column 1.

1	2	3	4	5	6	7	8	9	10
78	78,3	Cyl. 6	99 776 6.., 99 777 6..						
AFB		07.1998 → 05.2005	D (LA)	6	2496 cm ³	4V	110 kW	(150 PS)	19,5 86,40 mm
AKN		07.1998 → 05.2005	D (LA)	6	2496 cm ³	4V	110 kW	(150 PS)	19,5 86,40 mm
PL	St/B/S	57,978	61,619	17,00	1,801	STD		6	77 701 600
↑	SPUTTER	57,958	61,600			0,25			77 701 610
PL	St/B/G	57,978	61,619	17,00	1,801	STD			
↓		57,958	61,600			0,25			
HL	St/B/G	64,978	70,019	18,50	2,508	STD		4	77 850 600
		64,959	70,000			0,25			77 850 610
						0,50			77 850 620



Information on the product range can be found at
www.ms-motorservice.com

HEADQUARTERS:

MS Motorservice International GmbH

Wilhelm-Maybach-Straße 14–18

74196 Neuenstadt, Germany

www.ms-motorservice.com

www.rheinmetall.com

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