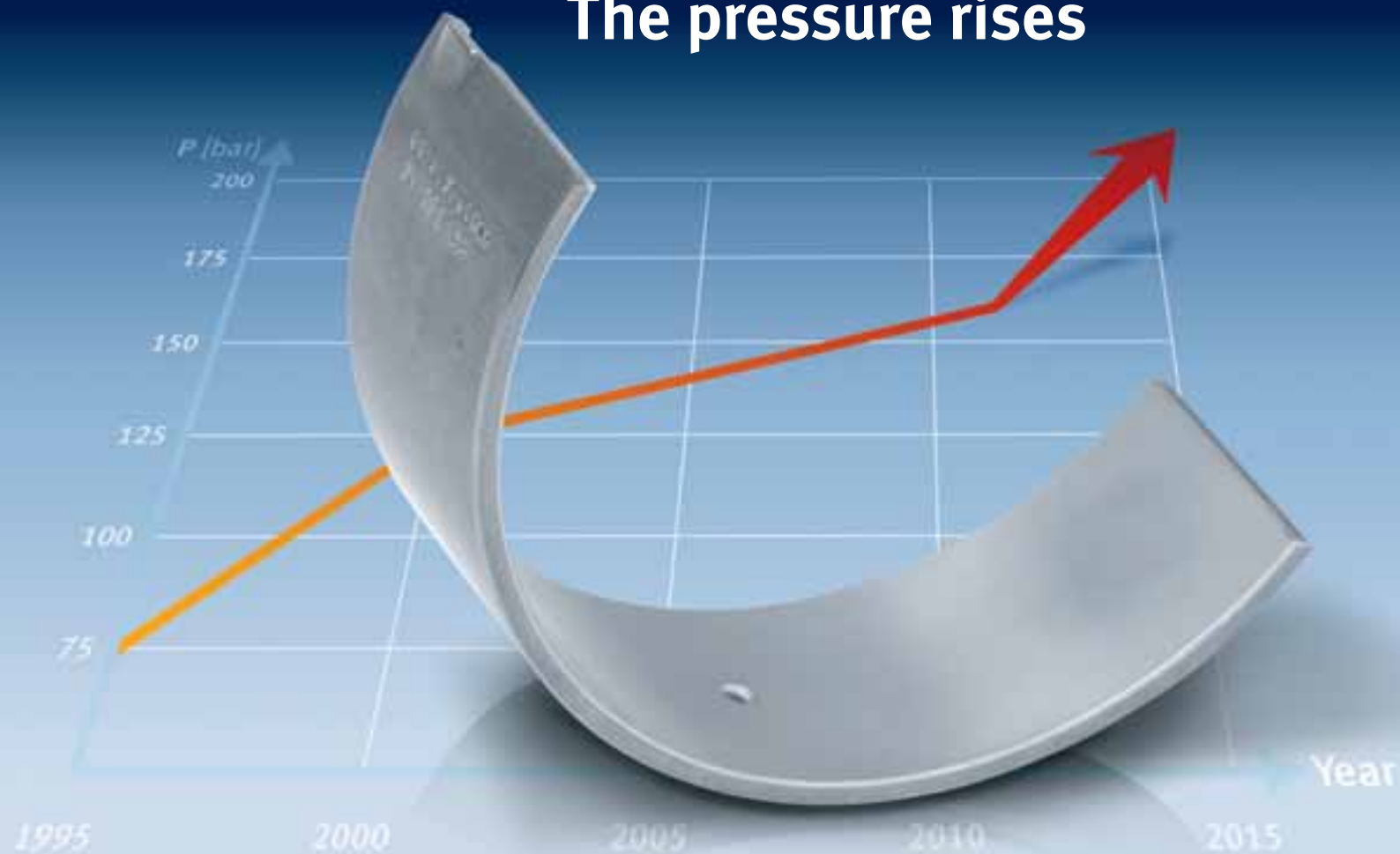




# SPUTTER BEARINGS



## The pressure rises



# 200 bar pressure. *So what?*

## KS 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”.

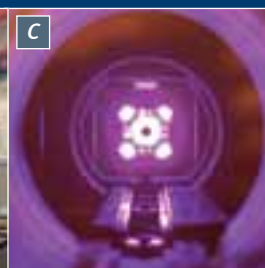
In modern turbo diesel engines, conrod bearings and main bearings are already submitted to combustion pressures of 180 bar, and an increase to peak pressures of 200 bar and beyond are anticipated. With such working pressures, the stress limit of conventional two- and three-component bearings is exceeded: high-performance bearings—so-called sputter bearings—are used.



**A Basic material:** the high-grade materials used in three-component bearings.

**B PVD process:** Magnetron coating.

**C Internal space of sputter system:** The top layer of the bearing shells is refined with the aid of gas ions in a high vacuum. **D Quality inspection:** Assurance of the high KS 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.*

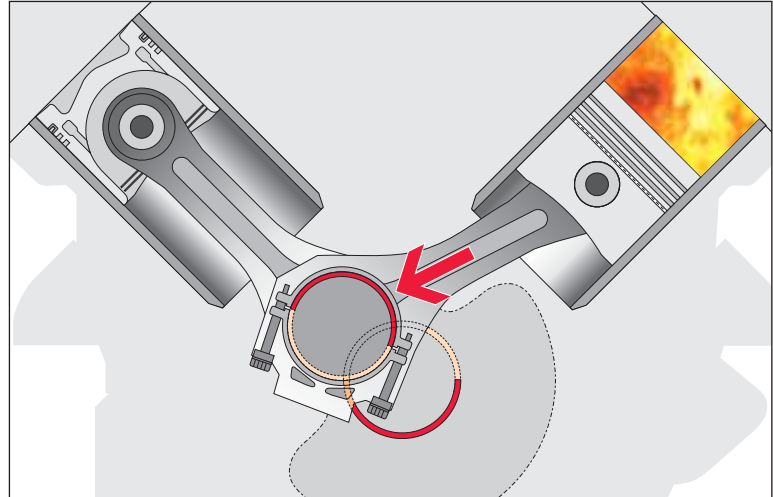




# Modern diesel engines really put on the pressure.

## 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/mm<sup>2</sup>.*

## And this is how to find the most 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 KS Engine bearings Catalogue. KS sputter bearings are marked with "Sputter" on the back to distinguish between the two bearing shells.

	1	2	3	4	5	6	7	8	
<b>15</b>		<b>78,3</b>	<b>Cyl. 6</b>	99 777 6..., 99 776 6...					
<b>AFB Euro 2</b>			04.1997→06.2000	D (A)	6	2496 cm <sup>3</sup>	4V	110 kW (150 P)	
<b>AKN Euro 3</b>			11.1997→09.2002	D (A)	6	2496 cm <sup>3</sup>	4V	110 kW (150 P)	
<b>PL</b>		St/B/S	57,978 57,958	61,619 61,600	17,00	1,801	STD 0,25 0,50		
<b>PL</b>		St/B/G	57,978 57,958	61,619 61,600	17,00	1,801	STD 0,25 0,50		
(1)	Die obere Lagerschale ist mit 'SPUTTER' gekennzeichnet. The upper shell is marked with 'SPUTTER'. Le coussinet supérieur est marqué de 'SPUTTER'. El cojinete superior está marcado con 'SPUTTER'.								
<b>HL</b>		St/B/G	64,978 64,959	70,019 70,000	18,50	2,508	STD 0,25 0,50		

### Essential!

In the KS Engine bearings Catalogue, the KS sputter bearings are marked with an "S" in column 2. The assembly position is shown by the arrow in column 1.





## KS Plain Bearings

... are an essential component for internal combustion engines. Complex requirements and increased strains on the supporting elements of moving engine parts, such as for instance crankshafts, connecting rods, tappets and camshafts, generally demand the use of materials that have been carefully adapted to the respective application.

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