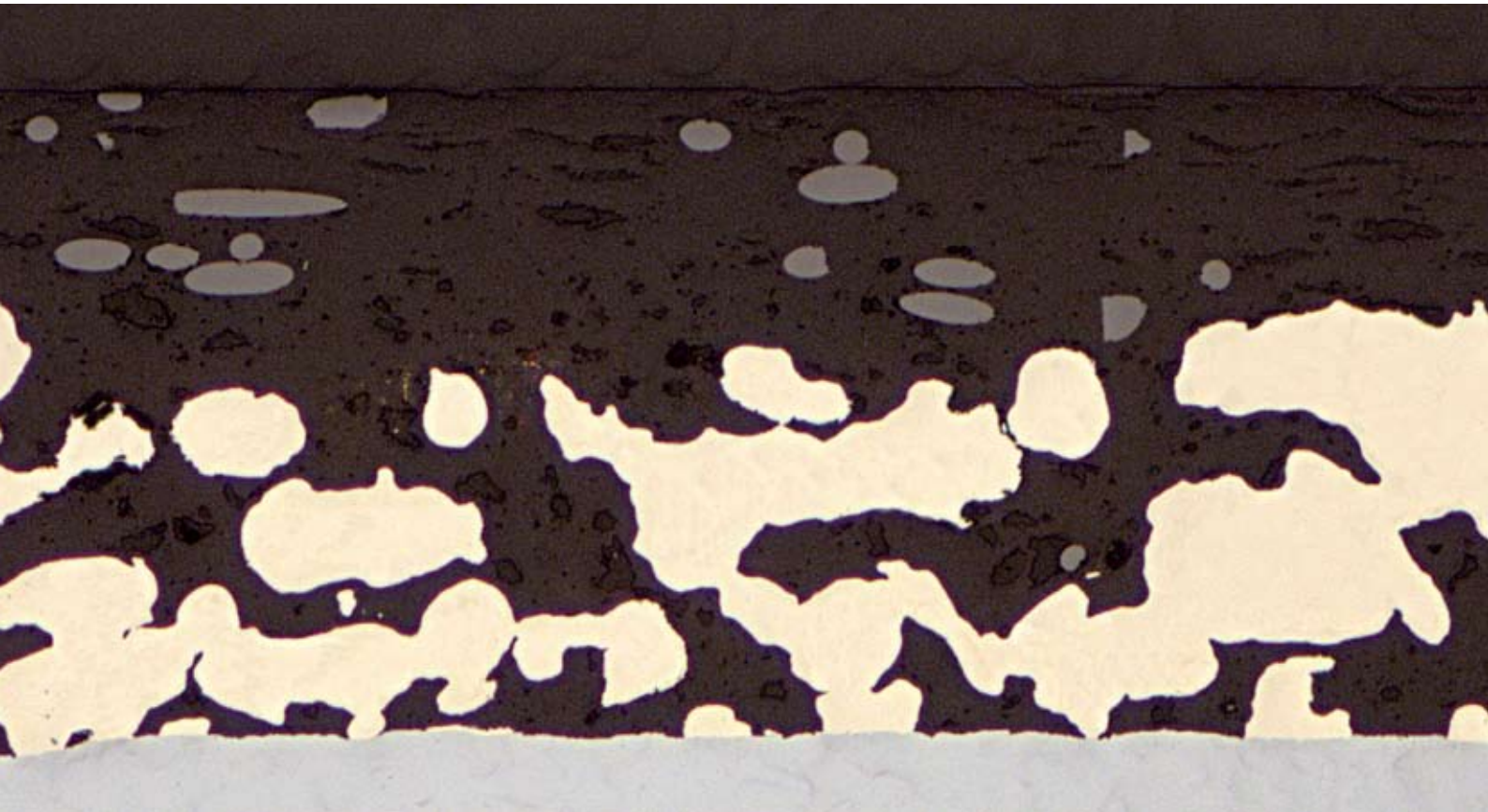


KOLBENSCHMIDT PIERBURG GROUP



KS P200 – KS P203

Low-maintenance, Lead-free  
Steel/Plastics Composites



GLEITLAGER

## Brief description of the sliding material

The materials KS P200 to KS P203 includes different versions regarding the sliding layer thickness and the profile of the sliding layer surface.

Bearing type	Characteristics			
	Coat above bronze	Ready for installation	Machining allowance	Lubrication pockets <sup>1)</sup>
KS P200	0.1 mm	●		●
KS P201	0.2 mm		●	●
KS P202	0.2 mm		●	
KS P203	0.1 mm	●		

<sup>1)</sup> Lubrication pockets acc. to DIN ISO 3547

The base material is composed of a steel back, a bronze interlayer and a PVDF sliding surface with purpose-selected fillers.

These plain bearings made of KS P200 – KS P203 have been designed for application in tribological systems with initial lubrication (e.g. grease) or under hydrodynamic conditions featuring elevated mixed friction characteristics.

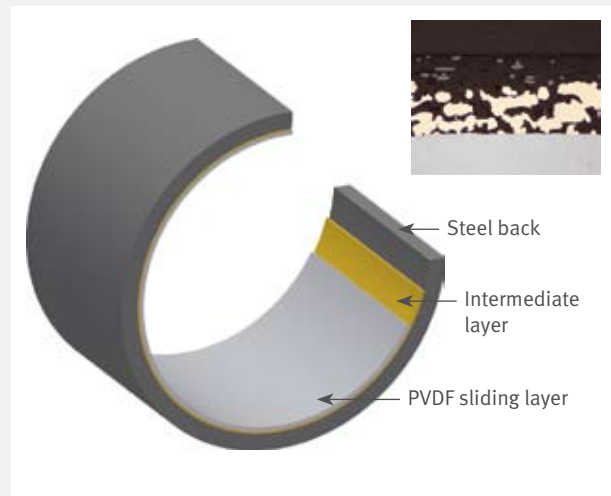
## Bearing structure

The steel back is made of grade DC04. Its hardness ranges from 100 HB to 180 HB.

The interlayer is composed of spattered CuSn10 bronze with a pore volume of about 45 % and a mean layer thickness of around 0.3 mm. The contact surface is made up of a PVDF layer reinforced with fillers.

## Manufacture of the sliding material

In a continuous sintering process, the bronze interlayer is sintered onto a prepared steel surface (strip) such that a pore volume of about 45 % is obtained. Subsequently, the sliding surface coat is applied in the form of a powder and



Layer system: steel back / intermediate layer / PVDF sliding layer



Plain bearing bushing with lubrication pockets and lubricating opening

## Material characteristics

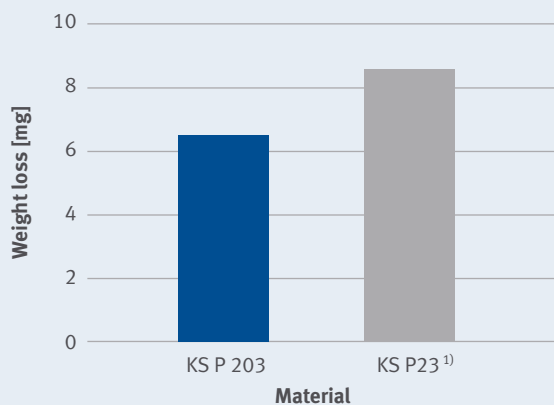
Characteristics, limit loads	Unit	KS P200-P203
<b>Permissible specific bearing load p</b>		
■ Static	N/mm <sup>2</sup>	250
■ Very low sliding speed	N/mm <sup>2</sup>	140
■ Dynamic load	N/mm <sup>2</sup>	70
<b>Permissible sliding speed v</b>	m/s	3 <sup>1)</sup>
<b>Permissible temperature range</b>	°C	-40 to +110
<b>Coefficient of thermal conductivity</b>	W (m·k) <sup>-1</sup>	> 3

<sup>1)</sup> under hydrodynamic conditions up to 5 m/s

### Chemical composition of the sliding layer

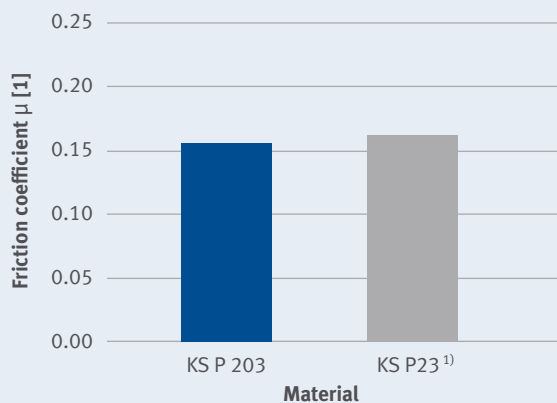
in vol-%	Material	Percentage
	PTFE	10.5 %
	BaSO <sub>4</sub>	21.5 %
	C fibers	2.5 %
	PVDF	rest

### Comparison of the tribological performance Wearing properties (crash test)



<sup>1)</sup> Lead-containing material

### Comparison of the tribological performance Friction behavior (crash test)



<sup>1)</sup> Lead-containing material

### Wear, friction coefficient

#### Test conditions (ring-plate test bench)

- Rotation, point load
- Test load:  $F = 20 \text{ N}$
- Sliding speed:  $v = 1.57 \text{ m/s}$
- Temperature: RT
- Lubrication: without
- Shaft material: 100 Cr6
- Test duration: 20 h

expanded into the bronze interlayer at elevated temperature. Any lubrication pockets required are produced simultaneously. The necessary thickness accuracy of the composite is adjusted in a further calibration rolling process.

### Chemical resistance

	Engine oil	Damper oil	Transmission oil	Hydraulic oil
Temperature (°C)	150	150	150	120
Duration (h)	528	528	528	528
Thickness (μm)	1–3	0–8	0–3	0–5
Damage through chem. attack	none	none	none	none

### Plain bearing manufacture

Sliding elements of the most varied shapes are produced from the composite material by cutting, punching and forming. At the end, a fine-tuned corrosion protection treatment is carried through adapted to each specific case of application.

### Quality

The entire production process is monitored and controlled by means of a close-meshed net of quality assurance measures, thus ensuring process reliability of all important plain bearing characteristics.

### Application

The plain bearings made of KS P200–KS P203 have been designed for application in tribological systems with initial lubrication or under hydrodynamic conditions. The plain bearings excel by high wear resistance, satisfactory resistance to chemicals and minimized sensitivity to edge pressure and shocks. When provided with grease lubrication, the sliding elements are additionally protected through the arise from the grease flange from dirt in-leakage. Plain bearings fabricated with machining allowance can be machined subsequently, to equal out any misalignment or adjust closer bearing clearances.

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G-P200 – P203

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