

Special coatings

In order that standard components can function for long periods, without maintenance and reliably even under extreme operating conditions, Schaeffler has developed various coatings for such requirements.

These coatings increase the corrosion resistance and/or wear resistance of the surface.

The selection of the coating is always dependent on the area of operation and the application.



Coatings have an effect on system accuracy. Tolerances for coated parts of linear recirculating roller bearing and guideway assemblies, see page 115, for six-row linear recirculating ball bearing and guideway assemblies, see page 225, for four-row linear recirculating ball bearing and guideway assemblies, see page 306.



Coated carriages and coated guideways must always be used in combination. If coated carriages are used with uncoated guideways, for example, this will lead to a reduction in preload.

Types of coatings

Components at risk of corrosion are protected by the:

- special coating Corrotect (RROC), see page 57
- thin dense chromium coating Protect A (KD), see page 59.



Corrotect special coating Corrosion protection

Corrotect is a surface coating applied by electroplating, *Figure 1*. The coating gives cathodic corrosion protection and is extremely thin. Under load, it is compacted into the surface roughness profile and partially worn away.

In parts coated with Corrotect, running-in occurs in the area of the seal and an optically bright area develops as a result. Due to the remote cathodic protection mechanism, formation of rust in this area can also be prevented.

Parts with Corrotect coating have the suffix RROC.

KUVE...B-RROC

Figure 1
Corrotect special coating –
Cr(VI)-free



Advantages of RROC

The special coating Corrotect:

- is resistant to moisture, salt spray mist, contaminated water and weak alkaline or weak acidic cleaning agents
- does not impair the load carrying capacity, in contrast to the use of corrosion-resistant steels
- is extremely resistant to corrosion
- offers protection against rust on all surfaces
- gives protection against rust even on smaller bright spots due to the cathodic protection effect
- gives protection against EP additives
- has good thermal conductivity
- is free from Cr(VI) and fulfils the requirements relating to RoHS in accordance with EU Directive 2002/95/EC
- is suitable for use in the food industry.

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Applications Components coated with Corrotect are particularly suitable where corrosion resistance is the most important factor. The coating can also be used to prevent adhesion of weld spray.

Available products The following products in the field of linear motion are available with the Corrotect coating:

- linear recirculating roller bearing and guideway assemblies RUE..-E
- linear recirculating ball bearing and guideway assemblies KUSE
- linear recirculating ball bearing and guideway assemblies KUV..-B
- linear recirculating ball bearing and guideway assemblies KUV..-W
- linear recirculating ball bearing units KUVS.

Suffixes Components with the Corrotect Cr(VI)-free coating have the suffix RROC, see Ordering example.

Ordering designation The ordering designation for a linear recirculating ball bearing and guideway assembly KUV45-B with the Corrotect Cr(VI)-free coating is, for example:

- KUV45-B-W1-V1-G3-RROC.

Technical/physical data for Corrotect The table shows technical/physical data for the special coating Corrotect.

Data for Corrotect

Characteristics	Data
Suffix	RROC
Colour	Colourless, blue to iridescent
Layer thickness ¹⁾	0,5 µm – 3 µm
Number of layers	1
Composition	Zinc alloyed with iron
Layer hardness	300 HV
Corrosion protection ²⁾	96 h
Coating resistance	The coating has reduced corrosion resistance for pH values < 6 and pH values > 8
Wear protection	–
Maximum single-piece length	3 500 mm
Cr(VI)-free	yes

1) Thickness in functional area.

2) Salt spray test in accordance with DIN EN ISO 9227.



Protect A

Wear and corrosion protection

Protect A is a pure chromium coating with a columnar surface structure, *Figure 2*.

The coating is applied by electroplating. The parts to be coated are heated to approx. +50 °C. Since no structural changes occur, the parts retain full dimensional stability.

The matt grey chromium layer retains a certain amount of lubricant in the recess between the Cr pearls. As a result, effective wear protection is achieved even under mixed friction or slippage conditions.

Parts with Protect A coating have the suffix KD.



KUBE..-B-KD

Figure 2
Thin dense chromium coating
Protect A

Special coatings

Advantages of KD

The coating:

- is resistant to various chlorides, various oils, sulphur compounds, chlorine compounds and weak acidic media
- does not influence the load carrying capacity and operating life of the coated products
- has higher wear resistance due to its high hardness
- ensures effective wear protection even under mixed friction conditions
- offers good protection against EP additives
- has good thermal conductivity
- is moderately resistant to corrosion
- prevents false brinelling under vibration while stationary
- is Cr(VI)-free and, at the time of issue of this catalogue, is compliant with the RoHS Directive 2011/65/EU.

The high hardness of the thin dense chromium coating and the special surface structure give an anti-wear effect. The columnar structure has a certain capacity for storage of lubricant. This ensures adequate lubricant in the rolling element contact zone even under extreme environmental and operating conditions.



For use in the food industry, compliance with exacting environmental and health conditions must be achieved. The coating Protect A is free from Cr(VI) and can therefore also be used in this sector.

Operating temperature

The temperature range of the guidance system is between $-10\text{ }^{\circ}\text{C}$ and $+80\text{ }^{\circ}\text{C}$.



Applications Protect A does not contain Cr(VI). Components with this coating are therefore particularly suitable for use in the food industry, medical equipment and similar areas.
The coating is recommended for particularly short stroke lengths and vibrations while stationary.

Available products The following products in the field of linear motion are available with the Protect A coating:

- linear recirculating roller bearing and guideway assemblies RUE...-E
- linear recirculating ball bearing and guideway assemblies KUV...-B
- linear recirculating ball bearing and guideway assemblies KUV...-W
- linear recirculating ball bearing units KUVS.

Suffixes Components coated with Protect A have the suffix KD, see Ordering designation.

Ordering designation The ordering designation for a linear recirculating ball bearing and guideway assembly KUV25-B with the Protect A coating is, for example:
■ KUV25-B-W2-V2-G3-KD.

Technical/physical data for Protect A The table shows technical/physical data for the special coating Protect A.

Data for Protect A

Characteristics	Data
Suffix	KD
Colour	Matt grey
Layer thickness ¹⁾	0,5 µm – 4 µm
Number of layers	1
Composition	Pure chromium layer with pearly surface
Layer hardness	900 HV – 1 300 HV
Corrosion protection ²⁾	8 h
Wear protection	Under mixed friction
Maximum single-piece length	4 000 mm
Cr(VI)-free ³⁾	yes

¹⁾ Thickness in functional area.

²⁾ Salt spray test in accordance with DIN EN ISO 9227.

³⁾ Parts free from Cr(VI) are suitable for the food industry.