

Coatings for multi-storey car parks and underground parking garages

KLB surface protection systems





High road safety for pedestrians and vehicles

Slip-resistant coating systems are indispensable in car parks of all kinds in order to meet the highest safety requirements. They must also provide sufficient grip on wet floors, both when vehicles start up or when they slow down. For pedestrians, the anti-slip surface results in safe footfall.



Effective protection of buildings

The main task of a surface protection system is to protect the building fabric from chemical or mechanical influences. Chemical substances such as de-icing salts dissolved in water or carbon dioxide from the air can attack concrete and reinforcing steel, thus weakening the substrate. Tested surface protection systems can prevent such damage in the long term.



Performance that has been tested and confirmed

When using KLB coatings, one can rely on a high level of quality: we guarantee this through strict, in-house quality controls of our coating products as well as external testing of the recommended system build-ups at renowned institutes in accordance with DIN EN 1504-2 and the TR maintenance directive.

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SURFACE PROTECTION SYSTEMS

KLB systems for the protection and maintenance of concrete components

OS system*	Application areas	Layer thickness**	Suitable KLB systems
OS 8 Rigid system for chemically and mechanically highly stressed surfaces that are accessible to vehicle traffic in the interior	Coating system for chemically and mechanically highly stressed surfaces that are accessible to vehicle traffic in the interior. e.g. roadways, parking areas, spindles and ramps, floor slabs in contact with the ground.	Layer thickness: At least 2.5mm OS8 Flex At least 4mm	Standard system: System K1 KLB PARKING EP OS8 Economical system: System K5 KLB PARKING EP OS8 Economic Statically crack-bridging system: System K6 KLB PARKING PU OS8 Flex
OS 11a Dynamically crack-bridging system for chemically and mechanically highly stressed surfaces that are accessible to vehicle traffic in the exterior including a very elastic floating layer.	Coating with increased dynamic crack-bridging capability for indoor or outdoor surfaces that are accessible to foot and vehicle traffic. Use on chemically and mechanically highly stressed concrete surfaces with a risk of crack formation. e.g. on weather-exposed open decks, indoor parking areas, bridge caps/paths.	Layer thickness: At least 4.5 mm	System K2 KLB PARKING PU OS11a
OS 11b Dynamically crack-bridging system for chemically and mechanically highly stressed surfaces that are accessible to vehicle traffic in the interior including an elastic wearing layer.	Coating with increased dynamic crack-bridging capability for indoor surfaces that are accessible to foot and vehicle traffic. Use on chemically and mechanically highly stressed concrete surfaces with a risk of crack formation. e.g. on intermediate decks, roofed open decks.	Layer thickness: At least 4.0mm	System K3 KLB PARKING PU OS11b
OS 14 Dynamically crack-bridging system for chemically and mechanically highly stressed surfaces that are accessible to vehicle traffic in the exterior including a very elastic floating layer.	Highly wear-resistant coating with increased dynamic crack-bridging capability for indoor or outdoor surfaces that are accessible to foot and vehicle traffic. Use on chemically and mechanically highly stressed concrete surfaces with a risk of crack formation. e.g. on weather-exposed open decks, indoor parking areas, bridge caps/paths.	Layer thickness: At least 6.0mm	System K4 KLB PARKING PU OS14

* In accordance with TR maintenance directive

** If necessary, plus roughness depth surcharge according to the maintenance guideline.

1.

Requirements to surface protection systems

Special systems for reliably protecting parking structures

The most expensive and dangerous damage to car parks and underground garages as concrete structures often occurs in areas of the building that are not directly visible. However, with suitable tested and certified coating systems for parking surfaces that are accessible to vehicle traffic, the underlying building components can be very well protected. To do so, surface protection systems offer special properties for durable and reliable protection.

Multi-storey car parks and underground garages are exposed to extreme mechanical, chemical or thermal loads. The constant vehicle traffic causes mechanical stress, oscillations and vibrations, which can lead to crack formation in the concrete. Harmful chemicals from vehicles, such as de-icing salts, fuel, oil and antifreeze, among others, can attack the coating and damage the building structure underneath. Without proper protection, carbon dioxide in the air can cause the concrete to carbonate when exposed to moisture – the concrete thus loses its alkaline environment, which promotes corrosion of the reinforcing steel in the concrete. Damage to these components impairs the statics or makes their use impossible.

In addition to protecting the building, surface protection systems also play a major role in safety and accident prevention for road users. A robust, slip-resistant texture of the covering ensures controlled accessibility on the coated surfaces and prevents slipping, even when the floor is wet or dirty.

To guarantee both a protected substrate and safe vehicle traffic, KLB surface protection systems are subjected to regular external tests and also undergo continuous quality assurance at the factory. This ensures the highest possible quality of our products.

The systems are tested and certified for use as a surface protection system on concrete following DIN EN 1504-2 in consideration of DIN V 18026, "Surface protection systems for concrete from products according to DIN EN 1504-2" and the "Technical Rule for the maintenance of concrete buildings" (2020). Primers used in the KLB surface protection systems have been tested for rear-side moisture exposure, e.g. floor slabs in contact with the soil, increased residual moisture of the substrate or young, not yet completely dry concrete slabs.



A SOLID BASE FOR UNDERGROUND PARKING

Surface protection system OS 8 for floor slabs in
multi-storey car parks and underground parking garages

2.

Protection of floor slabs and driveways in underground parking garages or multi-storey car parks

KLB PARKING EP OS8

Interior floor slabs in underground garages and multi-storey car parks form the basis for each additional storey. Special attention should be paid to these structural components, which are often in contact with the ground.

The building fabric needs to be protected by the coating against dirt, liquids or aggressive substances (engine oil, de-icing salts, etc.). At the same time, the floor system must provide protection against the effects of rear-side moisture. Surface protection systems are generally characterised by an increased slip-resistance and robust wear behaviour.

The epoxy resin-based coating is both robust and rigid. Thermal expansion due to temperature changes is only of secondary importance, as extremely rapid fluctuations do not occur in the area of the substrate. Dynamic crack opening of the building structure also does not take place around the floor slabs in contact with the ground.

System K1 KLB PARKING EP OS8

Surface protection system in accordance with TR maintenance directive

System features

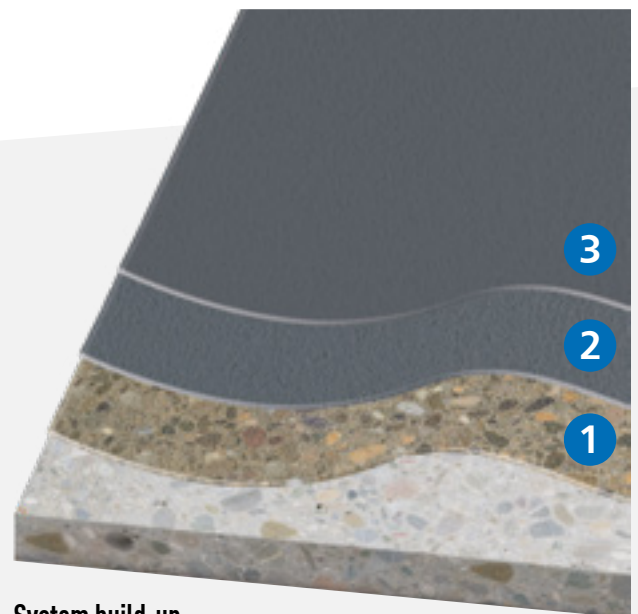
- slip-resistant, slightly non-slip surface
- wear-resistant
- reduction of water absorption
- protection against chemicals (chloride, oil, fuel, road salt) and carbonation
- improvement of frost and de-icing salt resistance
- tested against rear moisture exposure
- hardly inflammable B_{fi}-s1 (DIN EN 13501-1)

Colour: Available in a wide range of colours

Surface: Glossy, slip-resistant in R11



For more information on this system, see:
www.klb-koetzatal.de/en/systems/system-k1/



System build-up

3. Top sealer
KLB-SYSTEM EPOXID EP 216 Universal
2. Top coat
KLB-SYSTEM EPOXID EP 216 Universal,
fully scattered with quartz sand
KLB-Quarzsand 0.3/ 0.8 mm
1. Primer with **KLB-SYSTEM EPOXID EP 5520**,
openly scattered with quartz sand
KLB-Quarzsand 0.3/0.8 mm
as alternative to EP 5520: **KLB-SYSTEM EPOXID EP 5530**



RELIABLE, EVEN ON SLOPES

Slip-resistant surface protection system OS 8 for
driveways, spindles and ramps

3.

Robust coating for driveways and spindles

KLB PARKING EP OS8

Spindles and ramps are exposed to particularly high shear and thrust loads due to frequent braking and starting of vehicles. In addition to special slip-resistance requirements, very robust coatings are suitable here to permanently protect the underlying building structure from damage. In this area, an increased coating thickness and a tough-hard surface is required to withstand the stronger forces.

For ramps and driveways with high traffic volumes, it is recommended to increase the layer thickness and wearresistance of the system by applying another layer before the top sealer (see note in the system build-up).

The high slip-resistance of the covering improves the traction of motor vehicles and thus reduces the braking distance even in case of sudden stops. This helps to avoid accident black spots on ramps or spindles and increases safety.

System K1 KLB PARKING EP OS8

Surface protection system in accordance with TR maintenance directive

System features

- slip-resistant, slightly non-slip surface
- wear-resistant
- reduction of water absorption
- protection against chemicals (chloride, oil, fuel, road salt) and carbonation
- improvement of frost and de-icing salt resistance
- tested against rear moisture exposure
- hardly inflammable B_{fi}-s1 (DIN EN 13501-1)

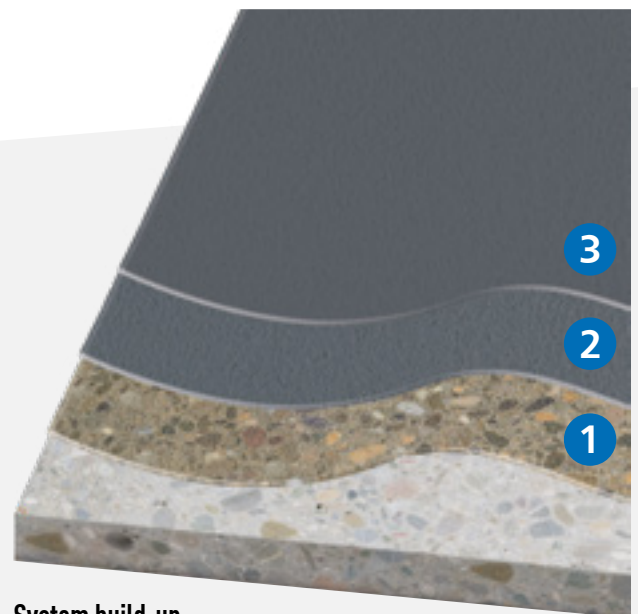
Minimum layer thickness: > 2.5 mm plus surcharge for roughness depth

Colour: Available in a wide range of colours

Surface: Glossy, slip-resistant in R11



For more information on this system, see:
www.klb-koetztal.de/en/systems/system-k1/



System build-up

3. Top sealer
KLB-SYSTEM EPOXID EP 216 Universal
Recommendation for ramps / driveways with high traffic:
Analogous to 2. Additional layer EP 216 Universal, filled with KLB quartz sand, fully scattered with KLB-Quarzsand 0.3/0.8 mm
2. Top coat with **KLB-SYSTEM EPOXID EP 216 Universal**, filled with quartz sand or suspending agent for ramps, fully scattered with quartz sand
KLB-Quarzsand 0.3/ 0.8 mm
1. Primer with **KLB-SYSTEM EPOXID EP 5520**, openly scattered with quartz sand
KLB-Quarzsand 0.3/0.8 mm
as alternative to EP 5520: KLB-SYSTEM EPOXID EP 5530

4.

Reliability meets economic efficiency

KLB PARKING EP OS8 Economic

The two-layered **System K5 KLB PARKING EP OS8 Economic** is the economical variant of an OS 8 surface protection system. Compared to **System K1 KLB PARKING EP OS8**, it consists of a combined priming and wearing layer. By saving a separate base coat, the workflow on the construction site can be optimised, as the entire system can be applied using just one epoxy resin product. Only KLB quartz sand is required for the scattering layer.

In addition to the lower material input, this build-up allows for shorter working hours, since the time for curing the primer no longer needs to be considered for when installing the coating.

Despite the omission of the primer, the total layer thickness of an OS 8 system must be at least 2.5 mm plus roughness compensation to ensure structural protection. It can be used in the same parking areas as the **System K1 KLB PARKING EP OS8** – this includes floor slabs, ramps and spindles.

System K5 KLB PARKING EP OS8 Economic

Surface protection system in accordance with TR maintenance directive

System features

- slip-resistant, slightly non-slip surface
- wear-resistant
- reduction of water absorption
- protection against chemicals (chloride, oil, fuel, road salt) and carbonation
- improvement of frost and de-icing salt resistance
- hardly inflammable B_{fi}-s1 (DIN EN 13501-1)

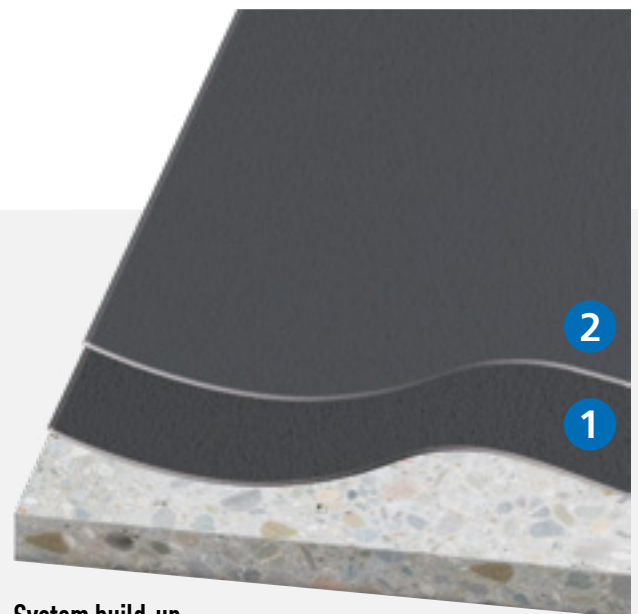
Minimum layer thickness: > 2.5 mm plus surcharge for roughness depth

Colour: Available in a wide range of colours

Surface: Glossy, slip-resistant in R11



For more information on this system, see:
www.klb-koetztal.de/en/systems/system-k5/



System build-up

2. Sealer
KLB-SYSTEM EPOXID EP 216 Universal
1. Priming coat and wearing layer with
KLB-SYSTEM EPOXID EP 216 Universal,
fully scattered with quartz sand
KLB-Quarzsand 0.3/ 0.8 mm

5.

Increased safety through static crack-bridging

KLB PARKING PU OS8 Flex

In addition to the proven characteristics of an OS 8 coating based on the TR maintenance directive, **System K6 KLB PARKING PU OS8 Flex** offers crack-bridging of up to 0.5 mm. The flexibility is mainly achieved by the **PU 5560** polyurethane coating, which is also used in our OS 11a system.

In the event of cracks in the substrate, the flexible wear layer prevents water and chemicals from penetrating the building fabric, thus extending the service life and reducing the maintenance requirements of the parking garage. The system is used particularly for interior floor slabs, ramps or driveways.

With an alternative lightfast top sealer, it can also be applied in areas exposed to direct sunlight without changing its colour.

System K6 KLB PARKING PU OS8 Flex

Surface protection system in accordance with TR maintenance directive

System features

- slip-resistant, robust, slightly non-slip surface
- reduction of water absorption
- protection against chemicals (chloride, oil, fuel, road salt) and carbonation
- improvement of frost and de-icing salt resistance
- Static crack-bridging according to DIN EN ISO 1062-7 Class A 3 (up to 0.5 mm at -10 °C / -14 °F)

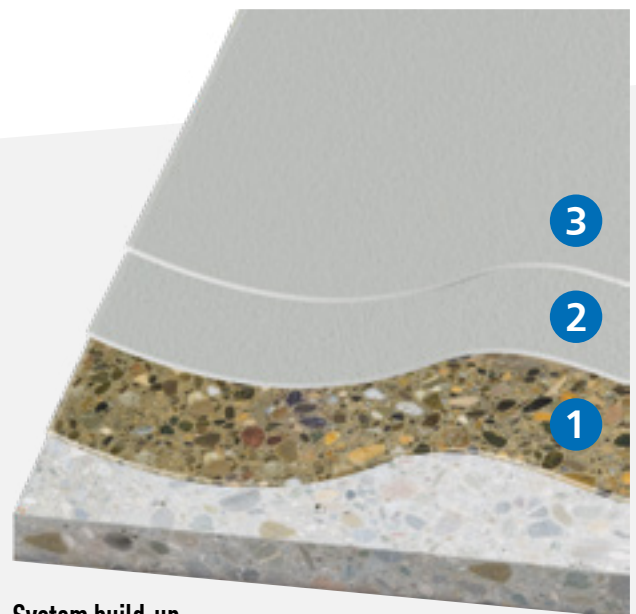
Minimum layer thickness: > 4 mm plus surcharge for roughness depth

Colour: Available in a wide range of colours

Surface: Glossy, slip-resistant in R11



For more information on this system, see:
www.klb-koetztal.de/en/systems/system-k6/



System build-up

3. Top sealer
KLB-SYSTEM EPOXID EP 5570
2. Flexible wearing layer with
KLB-SYSTEM POLYURETHAN PU 5560,
fully scattered with quartz sand
KLB-Quarzsand 0.3/0.8 mm
1. Primer
KLB-SYSTEM EPOXID EP 5520,
openly scattered with quartz sand
KLB-Quarzsand 0.3/0.8 mm



FLEXIBLE IN USE

Surface protection system OS 11b, dynamically crack-bridging for intermediate decks and roofed open decks

6.

OS system for intermediate decks and roofed open decks

KLB PARKING PU OS11b

Intermediate car park decks are usually wide-span storey ceilings. Since this mezzanine level acts as a ceiling on one storey and as a roadway on the other, the structural components are subject to constant temperature and load changes. These sometimes high load differences, both thermal and mechanical, can lead to cracks in the building that change over time from the dynamic stress. In the worst case, water or dissolved chemicals and de-icing salts can penetrate the substrate and damage it.

Without the right surface protection system tailored to the area of application, time-consuming and expensive refurbishment would be necessary. The coating system offers tested dynamic crack-bridging (0.3 mm at -20 °C / -4 °F). The building structure is thus permanently protected against the penetration of aggressive substances. The elastic wearing and sealing layer ensures a high level of robustness and durability, while at the same time providing the necessary dynamics demanded of such a system.

System K3 KLB PARKING PU OS11b

Crack-bridging surface protection system in accordance with TR maintenance directive

System features

- wear-resistant: Wear class tested with PAT test (Parking Abrasion Test): VK1
- dynamic crack-bridging (up to 0.3 mm at -20 °C / -4 °F, Class II T_V)
- slip-resistant, slightly non-slip surface
- reduction of water absorption
- protection against chemicals (chloride, oil, fuel, road salt) and carbonation
- improvement of frost and de-icing salt resistance
- tested against rear moisture exposure
- hardly inflammable B_{fi}-s1 (DIN EN 13501-1)

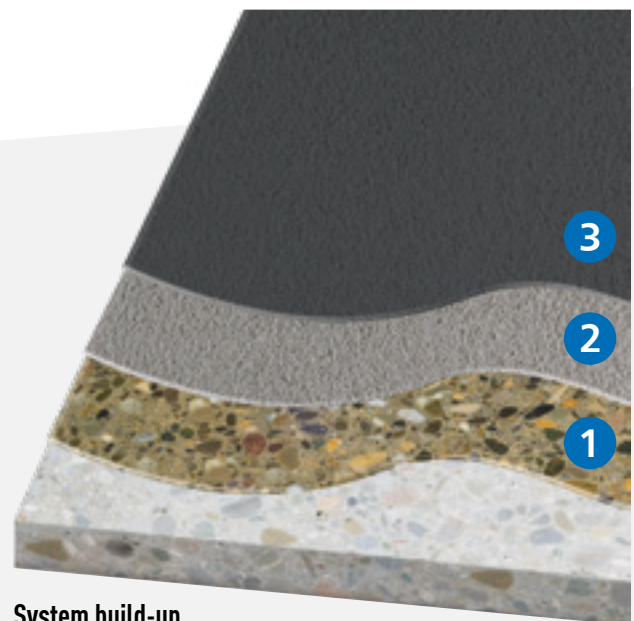
Minimum layer thickness: > 4.0 mm plus surcharge for roughness depth

Colour: Available in a wide range of colours

Surface: Glossy, slip-resistant in R10 or R11



For more information on this system, see:
www.klb-koetzal.de/en/systems/system-k3/



System build-up

3. Top sealer **KLB-SYSTEM EPOXID EP 5570**
alternatively: **KLB-SYSTEM POLYURETHAN PU 5580**
2. Elastic wearing and waterproofing layer **KLB-SYSTEM POLYURETHAN PU 5550**, fully scattered with quartz sand **KLB-Quarzsand 0.3/0.8 mm**
1. Primer with **KLB-SYSTEM EPOXID EP 5520**, openly scattered with quartz sand **KLB-Quarzsand 0.3/0.8 mm**
as alternative to EP 5520: **KLB-SYSTEM EPOXID EP 5530**



ROBUST, IN ANY WEATHER

Slip-resistant surface protection system OS 11a
for weather-exposed parking lots



7.

Weatherproof and UV-stable for weather-exposed parking surfaces

KLB PARKING PU OS11a

Open parking decks are directly exposed to weather conditions such as UV radiation, rain, snow and ice all year round. On sunny days, a thunderstorm can cause rapid and severe temperature changes. In addition to this, the outdoor deck must also withstand the mechanical stresses from vehicle and pedestrian traffic that occur in all parts of the car park. Equally important is the permanent protection of the reinforced concrete against chemical and mechanical influences, as well as the prevention of water and dissolved chemicals or other substances from penetrating.

This surface protection system offers an all-in-one solution for car park coatings, especially on open decks. The floating layer protects the building structure from water penetration and bridges dynamic crack width changes (up to 0.3 mm at -20°C / -4 °F) as caused by thermal or mechanical stress.

The wearing layer and the sealer applied on top of it are resistant to wear and tear, as well as to chemicals such as de-icing salts or fuels. With the light-resistant head sealer, an extended colour variety is available for creating sophisticated surfaces.

System K2 KLB PARKING PU OS11a

Crack-bridging surface protection system
in accordance with TR maintenance directive

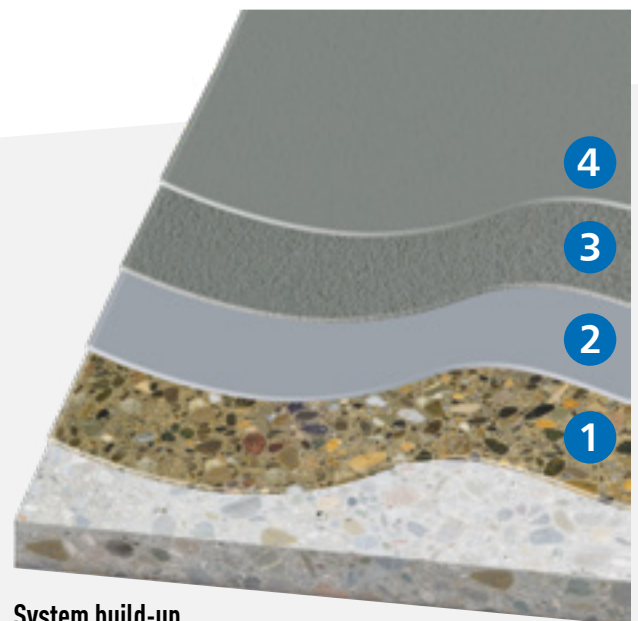
System features

- wear-resistant
- dynamic crack-bridging
(up to 0.3 mm at -20 °C / -4 °F, Class II T_V)
- slip-resistant, slightly non-slip surface
- weatherproof due to colour-stable top sealer
- reduction of water absorption
- protection against chemicals (chloride, oil, fuel, road salt) and carbonation
- improvement of frost and de-icing salt resistance
- hardly inflammable B_{fi}-s1 (DIN EN 13501-1)

Minimum layer thickness: > 4.5 mm plus surcharge for roughness depth

Colour: Available in a wide range of colours

Surface: Glossy, slip-resistant in R10 or R11



System build-up

4. Top sealer
KLB-SYSTEM POLYURETHAN PU 5580
3. Wearing layer with
KLB-SYSTEM POLYURETHAN PU 5560,
fully scattered with quartz sand
KLB-Quarzsand 0.3/0.8 mm
2. Floating layer with
KLB-SYSTEM POLYURETHAN PU 5550
1. Primer with **KLB-SYSTEM EPOXID EP 5520**,
openly scattered with quartz sand
KLB-Quarzsand 0.3/0.8 mm
as alternative to EP 5520: **KLB-SYSTEM EPOXID EP 5530**



For more information on this system, see:
www.klb-koetztal.de/en/systems/system-k2/



A MAXIMUM OF SURFACE PROTECTION

Highly robust surface protection system OS 14
with increased crack-bridging ability

8.

For more safety and high crack-bridging

KLB PARKING PU OS14

The robust and flexible surface protection **System K4 KLB PARKING PU OS14** is used for particularly high crack-bridging requirements: compared to the OS 11a system, it is able to dynamically bridge large crack widths.

In addition to the mechanical loads caused by vehicle or pedestrian traffic, the OS 14 variant, like the **System K2 KLB PARKING PU OS 11a**, protects the building fabric of car park upper decks against the effects of weather such as UV radiation, rain, snow or ice and remains flexible in the event of large or sudden temperature fluctuations.

Due to the increased crack bridging, the reinforced steel concrete can be permanently protected from chemical and mechanical attacks as well as against penetrating liquids.

The floating layer insulates the substrate against water ingress and bridges dynamic crack width changes (0.5 mm at -20 °C / -4 °F), such as those caused by thermal or mechanical stress, e.g. vibrations when driving. The top seal is lightfast and allows a wide variety of colours for designing high-quality surfaces in weathered outdoor areas.

System K4 KLB PARKING PU OS14

Surface protection system with increased crack-bridging in accordance with TR maintenance directive

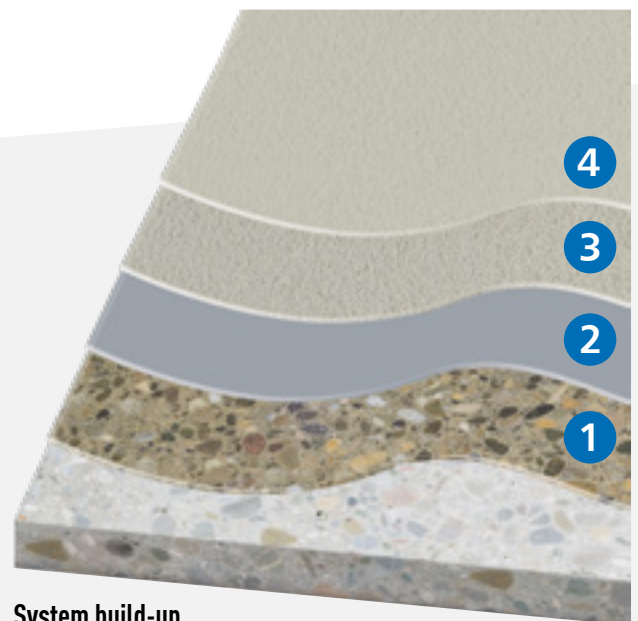
System features

- highly wear-resistant
- high dynamic crack-bridging according to DIN EN 1062-7, Class 4.2 (at -20 °C / -4 °F)
- slip-resistant, slightly non-slip surface
- UV-stable top sealer
- reduction of water absorption
- protection against chemicals (chloride, oil, fuel, road salt) and carbonation
- improvement of frost and de-icing salt resistance
- hardly inflammable B_{fi}-s1 (DIN EN 13501-1)

Minimum layer thickness: > 6.0 mm plus surcharge for roughness depth

Colour: Available in a wide range of colours

Surface: Glossy, slip-resistant in R10 or R11



System build-up

4. Top sealer
KLB-SYSTEM POLYURETHAN PU 5580
3. Wearing layer with
KLB-SYSTEM POLYURETHAN PU 5560,
fully scattered with quartz sand **KLB-Quarzsand 0.3/0.8 mm**
2. Floating layer with
KLB-SYSTEM POLYURETHAN PU 5550
1. Primer with **KLB-SYSTEM EPOXID EP 5520**,
openly scattered with quartz sand
KLB-Quarzsand 0.3/0.8 mm
as alternative to EP 5520: **KLB-SYSTEM EPOXID EP 5530**



For more information on this system, see:
www.klb-koetztal.de/en/systems/system-k4/

The image features a large, abstract graphic composed of overlapping chevron shapes. The chevrons are arranged in a series of parallel lines that recede into the distance, creating a sense of depth and movement. The colors used are a vibrant blue and a warm, earthy orange. The chevrons are set against a solid blue background that occupies the lower half of the image.

COLOUR VARIETY FOR ALL AREAS

Colour concepts for orientation and safety in car parks

9.

Colour variety of the KLB surface protection systems

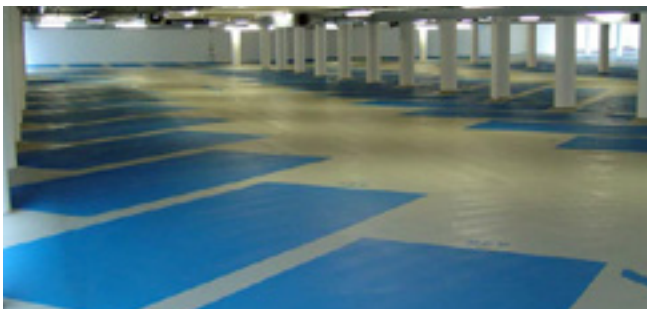
Design freedom for individual and safe car parks

Underground garages and multi-storey car parks are often the first point of contact for guests, visitors or customers when they arrive at the building. Whereas in the past, these places tended to be designed functionally, in recent years there has been an increase in creating a more inviting and attractive flair in the parking areas as well.

Colourful, bright and friendly-looking parking spots in shopping centres or public facilities give visitors a good feeling right from the start. Orientation aids through colour concepts on different storeys and the marking of roadways or footpaths can be realised with the KLB systems. These make it easier for visitors to find their way around the building and provide additional safety to reduce accidents between vehicles and pedestrians.

Corporate design also offers companies the opportunity to "pick up" customers right at the beginning of their visit and to keep this first impression in mind.

Our staff will be happy to advise you personally on how to realise your individual car park project.



The systematic approach to great flooring.

You can find more systems, references and brochures on our website:

www.klb-koetzal.de/en/systemfinder

www.klb-koetzal.de/en/klb-references



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