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- Worldwide patent
 - Over 30 years of protection
 - Refurbishment and new build

GRILLO -KKS-Beton

Active corrosion protection with zinc

Reliable corrosion protection made in Germany

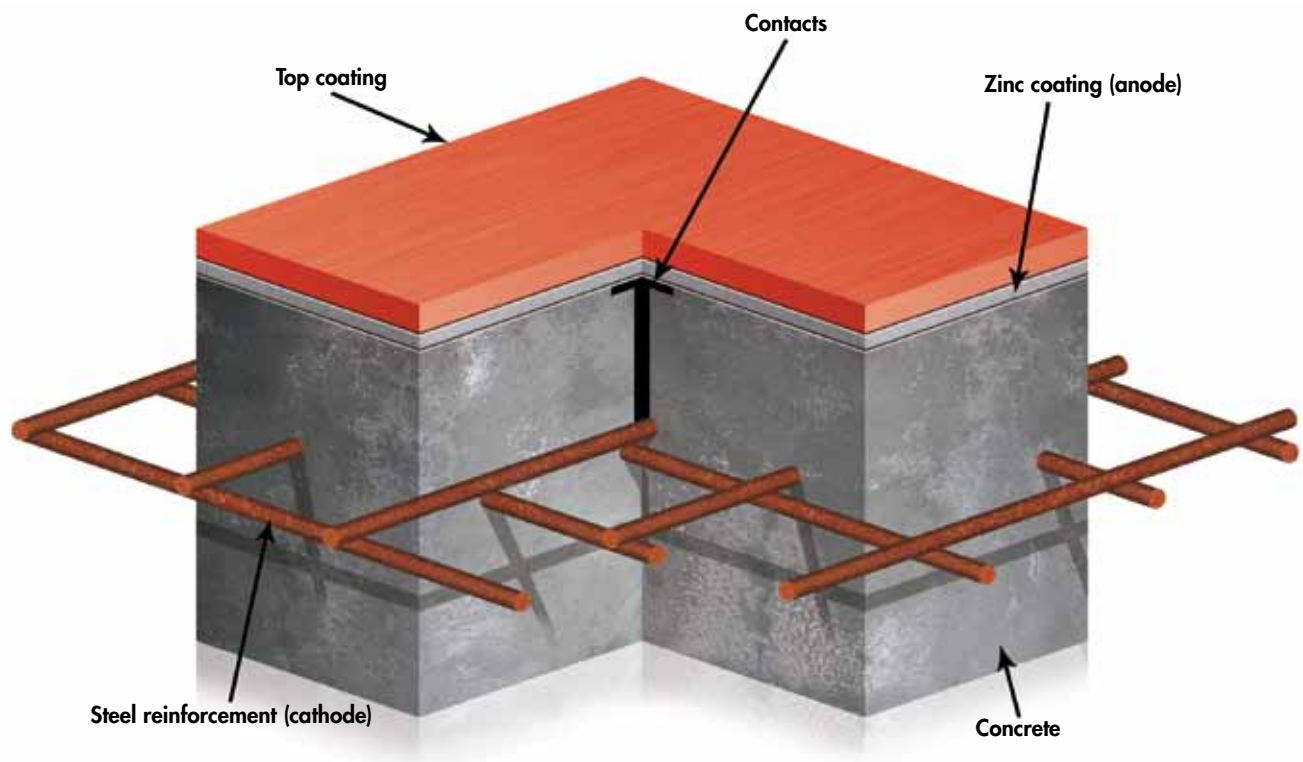
Causes of corrosion

The passivation of the reinforcement steel in reinforced concrete structures is based on the alkalinity of the concrete pore water. Due to external influences such as de-icing salts, carbon dioxide, sea water, and possible faults in construction (inferior concrete cover) and faulty design, the corrosion protection effect may be negated. In the presence of oxygen, corrosion (pitting, uniform corrosion) occurs on the reinforcement. The resulting damage is highly dangerous and can degrade the statics of the structure to the state of dilapidation. Apart from car parks and buildings, other structures affected are, in particular, bridges, shipyards, and on-shore/off-shore constructions.

GRILLO-KKS-Beton according to DIN EN 12696

The thermally sprayed zinc anode is used for the cathodic corrosion protection of steel in reinforced concrete. Galvanic zinc anodes have been used for over a hundred years in the protection of steel structures as well as in shipbuilding. This well-proven principle provides the basis for the development of Grillo-KKS-Beton. It goes back as far as the 1980s when cathodic corrosion protection with zinc anodes was already being used in order to protect steel reinforcement in concrete. This method is ideal for reinforced concrete structures which are subject to high chloride levels. Furthermore, it is also recommended to use sprayed zinc coating in new buildings as a preventive measure. The cathodic corrosion protection is achieved by an electric connection of the thermally sprayed zinc anode with the steel reinforcement. A protective current

is created due to the potential difference between the elements zinc and iron without any external electrical supply or control unit and its value depends on the present conditions of the building. The electric circuit is completed by means of the concrete pore solution which serves as an electrolyte. The anodic partial reaction of the iron dissolution is thus prevented. By applying a top coat, not only the zinc coating is protected against harmful environmental effects, but the service life of the system is also extended. Moreover, the top coat allows a wider range of application (e.g. trafficable surfaces, colour design and adaptation to existing surfaces). Specially engineered monitoring surfaces meet the requirements of DIN EN 12696.



The steel reinforcement remains fully protected thanks to zinc



Installation of GRILLO-KKS-Beton

Chloride-contaminated surfaces do not need to be removed any more. Thanks to the protective effect of the system, the chloride-contaminated concrete can be left as it is. As preparation for the use of the GRILLO-KKS-Beton cathodic corrosion system, patented worldwide, it is only necessary to repair the damaged areas and seal them with mortar. The preparation of the concrete surface is comparable to preparing the substrate for the application of a top coat system and is carried out by blasting. At the same time as the re-profiling of the concrete, the contacts can be inserted which will subsequently connect electrically the zinc anode and the reinforcement. Afterwards, the zinc coating is sprayed on the concrete surface and finally, a matching top coat system is applied immediately. The GRILLO-KKS-Beton system will then function maintenance-free to the end of its service life which may be over 30 years depending on the design and environmental conditions.

Thermal spraying

Zinc spray coatings are applied by means of wire arc spraying. This method has been used for many years in order to protect steel against corrosion. In the arc spraying process, an electric current is applied to two zinc wires which are brought together in a spray gun so that an electric arc is formed between the wire ends. The wire ends melt and molten metal droplets form which are atomised and propelled by an air jet to the prepared surface. When striking the concrete surface, the droplets solidify and form a compact coating which adheres firmly to the surface but is still vapour permeable. For cathodic corrosion protection of reinforced concrete, the thickness of a zinc spray coating is usually

Fields of application:

- Multi-level car parks
- On-shore buildings
- Bridges
- Tunnels
- Off-shore structures
- Industrial plants
- Foundations

Advantages of GRILLO-KKS-BETON

- Cost-effective installation of the zinc anode by means of proven wire arc spraying
- Used for the refurbishment of old buildings or for new build
- A service life of more than 30 years may be achieved
- The thermally sprayed zinc anode can be economically renewed at the end of its service life or if damaged
- The system is maintenance-free and also operates without any additional electrical installation or control unit
- The service life is markedly extended by a top coat system
- Monitoring of the corrosion protection system according to DIN EN 12696



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