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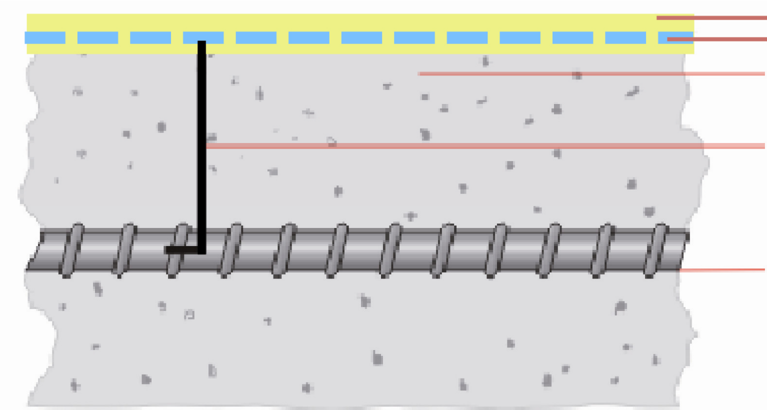
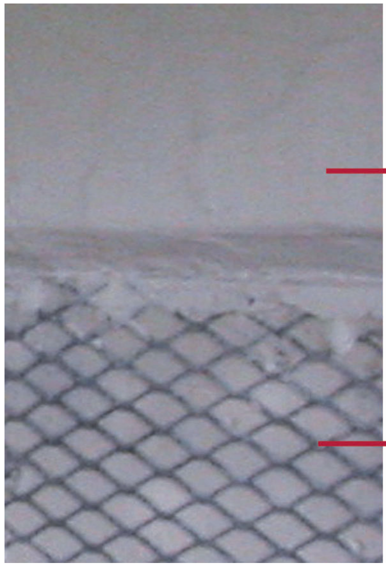
PASSIVE CORROSION PROTECTION WITH THE GALVANIC EZA SYSTEM

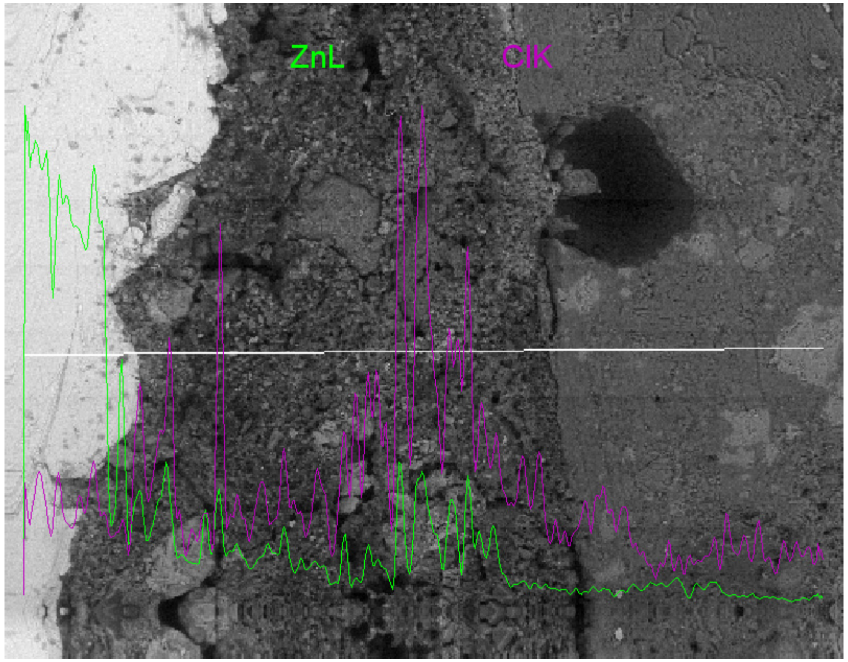


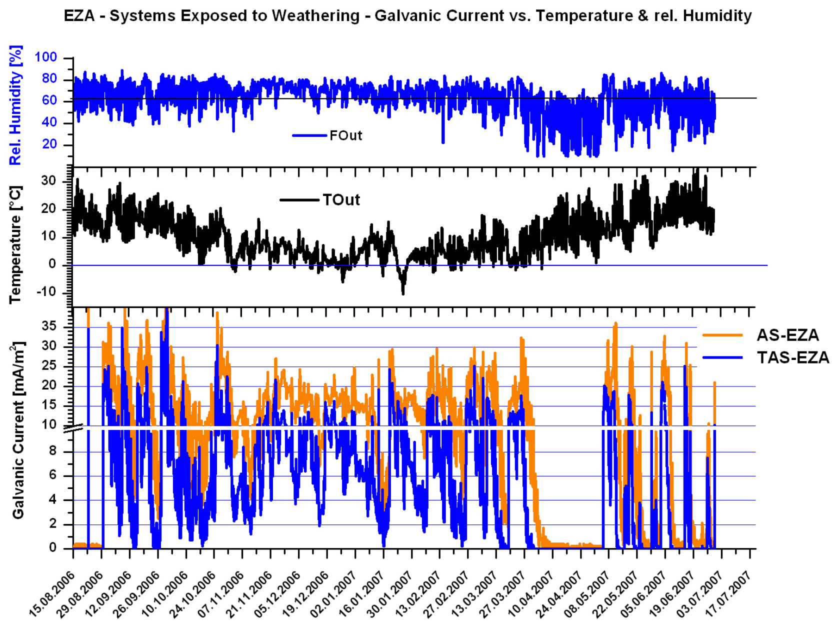
- **The EZA galvanic zinc anode is an innovative corrosion protection system that assures an optimum and reliable corrosion protection of the steel reinforcement in concrete.**
- **The zinc anode, a zinc mesh, is embedded into the proprietary solid electrolyte that ascertains an optimum electrolytic contact between the zinc anode and the steel reinforcement.**



- **The solid electrolyte, based on a tectoalumosilicate cement (TASC), prevents the self passivation of the zinc anode and therefore assures an optimum and reliable protection of steel reinforcement endangered by or already damaged by chloride induced corrosion.**
- **The zinc anode, a zinc mesh, is embedded into the proprietary solid electrolyte that ascertains an optimum electrolytic contact between the zinc anode and the steel reinforcement. Different from impressed current CP systems, hydrogen evolution is not possible on a EZA. The EZA galvanic zinc anode is especially suited for the corrosion protection of prestressed concrete structures.**

EZA - PASSIVE CORROSION PROTECTION OF STEEL IN CONCRETE





- The high and lasting activity of the EZA galvanic zinc anode is due to the custom designed properties of the solid electrolyte:
- Essential for the performance of the EZA galvanic zinc anode is the transport of anodically produced zinc from the zinc surface towards the concrete overlay as shown in the EDX picture, preventing the passivation of the zinc anode surface.
- Chlorides migrate into the solid electrolyte and are chemically immobilized within the solid electrolyte resulting in an efficient galvanic chloride extraction of the concrete overlay.

- As a surface system, the EZA galvanic zinc anode is exposed to weathering – wet/dry cycles, frost and UV-exposure. Optimum performance of the EZA galvanic zinc anode electrolyte is obtained at relative humidity's above 60 %. Galvanic activity cedes during extended dry periods (rel. humidity 20 – 60 %) but galvanic activity fully recovers if the relative humidity of the ambient air increases again to > 60% as shown in the picture to the left.

EZA - PASSIVE CORROSION PROTECTION OF STEEL IN CONCRETE

Average galvanic current	expected service time in years*		
	2 kg Zn/m^2	4 kg Zn/m^2	8 kg Zn/m^2
4	25	50	100
10	10	20	40

* expected service time is assumed to be terminated if about 50% of available zinc is consumed

- The EZA galvanic zinc anode is a sacrificial anode that is consumed during operation. According to Faradays law one may calculate the expected service time. High galvanic currents flow only during start up of the EZA galvanic zinc anode, after about half a year of operation the galvanic currents stabilize usually at values between 2 – 6 mA/m^2. Assuming that full protection of the steel reinforcement is ensured up to the consumption of 50% of the zinc mesh embedded into the solid electrolyte, one obtains expected service times as listed in the table to the left.

- The application of the EZA galvanic zinc anode system follows the procedure for applying repair mortars to concrete surfaces:
- The concrete surface has to be clean and the concrete overlay shall have a concrete resistance lower than 45 KOhm.cm.
- The concrete overlay has to be cleaned by sand blasting, high pressure water jetting, etc.
- , sensors and steel connections are installed if required
- The zinc-mesh is pressed onto a first layer of the embedding mortar
- The zinc-mesh is connected to the steel reinforcement, alternatively, connection to the steel may be established by soldering a copper wire to the zinc mesh
- The zinc-mesh is embedded into a second layer of the solid electrolyte

- Concrete members of civil Structures exposed to thaw salts as cantilevers, columns, abutments, walls of highway bridges, road bridges

- Parking Decks: Columns, Pavements

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- Marine Structures such as bridges, walls, concrete structures in harbors