



CATHODIC ELECTROPLATING ON EFFER MARINE CRANES

When applied to surfaces coating, the cataphoresis, or cathodic electroplating, is a process thought to protect even the less accessible region of the structures. This goal is achieved by the nature of the process itself, that is basically the movement of small suspended particles or molecules in a liquid driven by an electrical potential difference. Through this complete immersion of the crane structure into the coating bath, the whole steel surface is covered with a uniform and corrosion resistant layer of well adhered protection painting. The coating is applied in a continuous, fully automated process, as it involves several subsequent treatments that may be carried out only in dedicated plants. This application method, that is inherent to the process itself, also guarantees the benefit of avoiding application errors that are always possible when the painting procedures are carried out in a non automated process.

The main process applied to EFFER cranes structures is basically sandblasting and protection of the steel. Before undergoing the cataphoresis treatment, the steel structures are sandblasted (SA 2½) in the same plants where the coating is subsequently applied.

Immediately after sandblasting the crane structure passes through the process described as follows:

The cataphoresis protection process is divided into three sub-processes:

1. pre-treatment: seven step process of preparation and basic protection of the steel surface;
2. painting in immersion by cathodic electroplating;
3. heating treatment of the coated surfaces, to polymerise the coating that envelop the crane structure;

The spray pre-treatment process is carried out as follows:

- Degreasing with a warm (40÷45 °C) alkaline solution
- Degreasing with a warm (45÷50 °C) alkaline solution
- Washing with de-mineralised water
- Phosphating with phosphate coating materials (Zinc-Manganese-Nickel) at 42÷46 °C
- Passivation with de-mineralised water
- Washing with de-mineralised water
- Final washing with de-mineralised water and draining



The cathodic electroplating is carried out in a dedicated bath where an epossidic-amminouretanic paint solution is applied, by Continuous Current of decreasing intensity, to lay down on the steel structures (the cathode) the desired thickness of coating. The coating is black colour. The structure is then washed twice with ultra-filtered solution completed with a de-mineralised water washing with final draining.

The final stage of the process is the curing of the coating at medium-high temperature (approx. 40 min in heated atmosphere and approx. 20 min at 180 °C).

We summarise below the main features of the coating treatment:

FEATURES	METHOD	RESULT
Hardness	ASTM D3363 (Pencil)	5 H
Adhesion	DIN 53151	98÷100%
Resistance to saline fog	ASTM B117	500 h cont.
Impact	ASTM D 2794	Passes
Tapered chuck	ASTM 0522-73	Passes

The film obtained has excellent corrosion resistance and can be overpainted with conventional solvent products, water-soluble paints and powdered products. The characteristics summarised above are further improved by the final enamel coating of the standard or optional RAL.

EFFER is devoting the highest care to avoid the handling of the components after the cataphoresis treatment, during the assembly of the crane and its fittings and thus reducing any surface damages that may reduce the high reliability against corrosion guaranteed by this process and recently introduced by the Marine Division to enhance resistance against salt atmosphere and salt water effects. The whole design of the EFFER cranes has been thoroughly examined and modified to take in proper consideration this requirement and to achieve the highest level of corrosion resistance for EFFER cranes for work in a marine environment.