E-POLISHING (STAINLESS STEEL)

ELECTROPOLISHING

Electropolishing or electrochemical polishing is a treatment that allows to selectively remove the basis metal through anodic dissolution, taking advantage of thepassage of an induced current within an electrochemical system. The metalwork to be polished, that is the anode, is dipped into a dedicated basin for treatment, equipped by cathodes, that represents a real electrochemical cell. The technical operating conditions are set according to the type of material to be polished (stainless steel AISI 3xx,4xx, 630, DUPLEX, TITAN, COPPER, BRASS) taking into consideration the technological level of the electrolyte; usually you work with temperature having a range from 45° C to 60° C and with a tension of 7-16 V.

On the metalwork surface, submitted to anodic current, an highly viscous and resistance film forms. That film allows a slow ion scattering inside it, protecting the surface. The thickness for anodic insulating film is maxmum on creeks and minimum on projections, this causes a controlled selective corrosion of the surface, making it gradually more smooth.

On standard conditions, the removed thickness of basis metal is about 20-30 micron; the removal is reproducible, all technical-working conditions being equal.

Electropolishing, if correctly carried out,allows the superficial formation of a durable passive layer of chrome oxide, as a result of the anodic polarization, that protect the basis metal from the corrosive attack.

Function properties of the electropolished surface

By and large, degreasing, pickling and passivation treatments are sufficient for granting a good resistance to corrosion on stainless steel surfaces. However, in special environments (marine atmosphere, etc.) and, in special scopes for stainless steel (pharmaceutical, nautical, synthetic chemical, petrochemical, nuclear etc.) they need a significant improvement of specifications as far as hygiene and decontamination simplicity, fluency and above all resistance to corrosion are concerned. The electropolishing treatment fully satisfies these requirements .

The electrochemical polishing removes the damaged pieces of surface, made impure by extraneous material (such as for example little iron inclusions); besides, by means of electrochemical polishing it is possible to remove little tensions and micro cracks contained in the basis metal.

The brightness degree on electrochemically polished surfaces is, as a rule, higher than that one belonging to mechanically polished surfaces; however, because of the tip rounding of the roughness profilr, you will not have the mirror gloss effect, but a lightly widespread reflection.

Thanks to the functional aspect belonging to the tip rounding of the roughness profile and to the reduction of roughness on the treated surface, the electrochemical polishing, is a treatment able both to improve the sanitary status on surface, and to make more difficult the settlement of bacterial colonies (often responsible for corrosion phenomena, as well as being dangerous for human health).

The electrochemical polishing has the following advantages:

- Increasing stainless steel resistance to corrosion
- Improving hygiene and easiness for the decontamination on stainless steel surface
- Making more difficult the bacterial flora settlement
- Removing the small cracks and superficial stresses increasing the steel mechanical resistance
- Facilitating conduction and heat radiation on heat exchangers and solar panels
- Facilitating removal micro-burrs due to mechanical manufacturing
- Facilitating the fixing of possible following galvanic deposits.