



TECHNICAL NOTES

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Page 1 of 2

TREATMENT OF ELECTROLYTIC TIN COATING

1. GENERALS

A CONDUCTIVE MATHATERIAL DIPPED IN A PROPER SOLUTION COULD GIVE RISE TO INSOLUBLE ELECTRODEPOSITIONS' PRODUCTS BECAUSE OF THE TRANSFORMATION OF THE ELECTRIC WORK OF THE EQUIPMENT TO A CHEMICAL WORK.

ALL THE ELECTROLYTICAL PROCESSES MAY CAUSE THE DEPOSITION OF THE INSOLUBLE FILM THAT SUIT THE METALLIC-SURFACE IN ORDER TO PROTECT IT AND IMPROVE SOME CHEMICAL AND PHYSICAL DETAILS.

COMPARED TO A SURFACE-CONVERTING REACTION, THE SUPERFICIAL METAL DOES NOT REACT CHEMICALLY BUT IS SIMPLY PROTECTED (CATODIC PROTECTION) BY A LESS NOBLE METAL THAT CAN BE EASILY EARLY OXIDIZED: IN THIS CASE TIN ACTS AS A SACRIFICIAL ANODE.

THE TIN COATING IS OFTEN PREFERRED TO OTHER METAL-SURFACE TREATMENTS BECAUSE OF THE GREAT ELECTRICAL CHARACTERISTIC OF THE TIN AND OF THE REALLY GOOD ANTICORROSION RESISTANCE (SALT-FOG TEST).

IN ORDER TO OBTAIN A PERFECT PERFORMANCE OF THE TREATMENT, THE SUBSTRATES' SURFACE HAS TO BE PRIOR PREPARED THROUGH THE PARAMETERS DESCRIBED AS FOLLOW, FURTHERMORE THE ALREADY PROCESSED ITEM CAN BE EASILY IMPROVED AS CHEMICAL AND PHYSICAL CHARACTERISTICS BY A PROPER SEALING STEP.

2. APPLICATION

THE PRESENT PROCEDURE IS SUITABLE TO ALL METALS AND ALLOYS THAT PRESENTS ELECTIC-CONDUCTIVITY PROPERTIES. IN PARTICULAR ON BOLTS, NUTS, ODDS AND ENDS AND SMALL ITEMS UP TO 1,0 METRES LONG. THE PRESENT PROCEDURE IS PERFORMED WITH RESPECT TO THE NORM UNI-ISO 2093/90.

3. CYCLE

CHEMICAL-CLEANING: THIS STEP CONCERNS THE ITEMS DIPPING IN A CONCENTRATED ALKALINE-BATH AT THE OPERATIVE TEMPERATURE OF 55°C FOR ABOUT 15 MINUTES, IN ORDER TO DEGREASE THE SURFACE AND ELIMINATE ALL THE ORGANIC COMPOUNDS (THE TIME IS STRICTLY RELATED TO THE AMOUNT OF GREASE-OIL ON THE GOODS). IN FACT THE ORGANIC SUBSTANCES ACT AS INSULATOR AGAINST THE ELECTRONIC TRANSFER WHICH IS THE CORE OF THE ELECTROLYTIC SYSTEM.

PICKLING: TO ELIMINATE THE PRESENCE OF INORGANIC OXIDES ON THE ITEMS' SURFACE THIS STEP BECOMES INDISPENSABLE. THE BATH CONSISTS IN A SOLUTION OF CHLORIDRIC ACID (100 G/LT) WHERE THE ITEMS MAY STOP FOR ABOUT 10 MINUTES DEPENDING ON THE AMOUNT OF OXIDES ON THE SURFACE. HOWEVER THIS STEP CAN BE EVEN AVOIDED IF THE SURFACE DOES NOT PRESENT ANY OXIDES.



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Page 2 of 2

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RINSING: THE RINSING STEP ALLOWS TO NEUTRALIZE THE SUPERFICIAL pH THEREFORE WITH A NEUTRAL pH THE REACTIONS ON THE SURFACE ARE MORE EFFICIENT AND IT ALLOWS TO AVOID THE POLLUTION BETWEEN DIFFERENT CHEMICAL BATHS. IT IS PERFORMED BY A WATER-FLOW COMBINED WITH AIR-BUBBLING FOR AT LEAST ONE MINUTE.

ELECTROLYTIC-CLEANING: THIS STEP CONCERNS THE ITEMS DIPPING IN A CONCENTRATED ALKALINE-BATH WITH A VOLTAGE APPLIED FOR ABOUT 20 MINUTES, IN ORDER TO DEFINITELY ELIMINATE THE SUPERFICIAL ORGANIC PHASE. THE DEVELOPPED ANODIC-CORRENT GENERATES A MECHANICAL OXYGEN BUBBLING THAT INDUCES A CLEANING. FURTHERMORE, IT ALLOWS SMOOTHING A BIT THE SURFACE THAT COMBINED WITH THE ELIMINATION OF THE ORGANIC APOLAR COMPOUNDS LET OBTAIN A BETTER AND PERFECTLY CLINGED FILM.

ELECTROLYTIC TIN COATING: IT IS THE ELECTRODEPOSITION OF A PROTECTIVE TIN-FILM ON A SURFACE THROUGH AN ELECTRONIC TRANSFER APPLIED BY A VOLTAGE.

THE PROTECTIVE FILM GUARANTEES THE CORROSIONS' RESISTANCE WHEN IT APPEARS HOMOGENEOUS AND THICK ENOUGH (MINIMUM THICKNESS ADVISED IS 3 MICRONS) BECAUSE IT PROTECTS THE ITEM AS A CATHODIC PROTECTIVE FILM. IN FACT, THE TIN FILM SELF PASSIVATES ITSELF BY A THIN LAYER OF TIN OXIDE THAT IMPROVES ITS RESISTANCE AGAINST THE AGGRESSIVE AGENTS. THE PROCESS IS CONTROLLED BY FREQUENT AESTHETIC CONTROLS ON THE PROCESSED GOODS, BY THE THICKNESS TEST, BY THE SALT-FOG CABINET TO CHECK THE CORROSION RESISTANCE.

SEALING (OPTIONAL): IN ORDER TO OBTAIN A BETTER PRODUCT TO RESIST MORE AGAINST THE AGGRESSIVE AGENTS THIS STEP BECOMES FUNDAMENTAL. IT IS PERFORMED THROUGH AN ITEM-SOAKAGE INTO EMULSIFYING OIL LIKE THE TORQUE-N-TENSION OR CRUDE OIL LIKE ANTICORIT 77 (FUCHS).

DRYING: DEPENDING ON THE KIND OF MATERIAL IT IS PERFORMED BY A TIMED AND TEMPERATURE-CONTROLLED SPIN-DRYER MACHINE (OVEN).