



## TECHNICAL NOTES

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### ALUMINIUM PASSIVATION-PHOSPHOCROMATATION

#### 1. GENERALS

IT IS APPLIED ON THE ALUMINIUM TO PREVENT AGAINST THE CORROSIVE AGENTS AND AS A FILM-SUBSTRATE OF FURTHER VARNISH-LAYERS. IT IS CALLED ALSO PHOSPHOCROMATATION WHERE THE PROTECTIVE FILM CONTAINS ONLY CHROME (III). THEREFORE IT IS OFTEN PREFERRED TO REPLACE THE OLD HEXAVALENT CHROME CROMATATION WITH REGARDS TO THE UE ENVIRONMENTAL NORMS (SUCH AS RoHS, REACH AND SO ON). GOOD CORROSION RESISTANCE (SALT FOG CABINET TEST= 72 HOURS FOR COMMON CASTINGS WITH REGARDS TO NORM UNI ISO 9227/2006), GOOD ADHERENCE AS PRE-VARNISHING LAYER AND PRESERVATION OF ELECTIC AND MAGNETIC PROPERTIES OF THE ITEMS' SOSTRATE. IT IS A CONVERSION OF THE SURFACE BECAUSE OF THE REACTION BY THE ALUMINIUM SOSTRATE AND THE SOLUTION SALTS.

#### 2. APPLICATION

THE PRESENT PROCEDURE IS REFERRED TO ALL KIND OF ALUMINIUM ALLOYS. IN PARTICULAR, TO ODDS AND ENDS OR ITEMS UP TO 3 METRES OF LENGHT. FURTHERMORE IT IS POSSIBLE TO DEFINE THEN APPLY NEW SPECIFIC JIGS IN ORDER TO TREAT DIFFENT KIND OF GEOMETRIES AND SHAPES. IT IS A PARTICULAR APPLICATION DEPENDING ON THE SHAPE OF THE ITEM, ON THE EDGES AND WELDINGS AND THE SUPERFICIAL ACTIVATION. IN CERTAIN CASES IT IS NECESSARY TO PROCESS THE MATHERIAL BY A PRIOR SANDBLASTING STEP.

#### 3. PERFORMANCE

**CHEMICAL-CLEANING:** THIS STEP CONCERNS THE ITEMS DIPPING IN A CONCENTRATED ALKALINE-BATH AT THE OPERATIVE TEMPERATURE OF 40°C FOR ABOUT 30 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 SUPERFICIAL REACTION BETWEEN REAGENTS AND ALUMINIUM SOSTRATE.

**PICKLING (OPTIONAL):** TO ELIMINATE THE PRESENCE OF INORGANIC OXIDES ON THE ITEMS' SURFACE THIS STEP BECOMES INDISPENSABLE. THE BATH CONSISTS IN A SOLUTION OF NATRIUM HYDROXIDE (5 G/LT) WHERE THE ITEMS MAY STOP FOR AROUND 5 MINUTES DEPENDING ON THE AMOUNT OF OXIDES ON THE SURFACE. HOWEVER THIS STEP CAN BE PROPERLY AVOIDED IF THE SURFACE DOES NOT PRESENT ANY OXIDES (OR HAS BEEN ALREADY CLEANED BY MECHANICAL PROCESSES E.G. SANDBLASTING, POLISHING)



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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 TEN MINUTES.

**PHOSPHATE-CROMATATION:** IT IS A DIPPING IN A TANK WHERE THE SOSTRATE OF THE ITEM CAN REACT HOMOGENEOUSLY WITH THE REAGENTS. THE FILM IS A MIXTURE OF ALUMINIUM AND CHROME(III) SALTS OF SOME NANOMETER-THICKNESS. THE COLOUR OF THE PHOSPHATE-CROMATATION FILM APPEAR COLOURLESS WITH GREEN-YELLOW IRIDESCENCES.

**DRYING:** DEPENDING ON THE KIND OF MATHERIAL IT IS PERFORMED BY A TIMED AND TEMPERATURE-CONTROLLED OVEN.

**SEALING (OPTIONAL ON REQUEST):** IN ORDER TO OBTAIN A BETTER PRODUCT TO RESIST EVEN MORE AGAINST THE AGGRESSIVE AGENTS THIS STEP BECOMES FONDAMENTAL. IT IS PERFORMED THROUGH AN ITEM-SOAKAGE INTO EMULSIFYING OIL LIKE THE WHITE-OIL SOLUTION OR CRUDE OIL LIKE ANTICORIT 77 (FUCHS).