



High efficiency anodizing at high speed

HEA PROCESS



HEA: the "Formula 1 process of anodizing"

INTRODUCTION

Italtecno's research laboratory has developed a new system for anodizing which improves:

- efficiency (**LOWER ENERGY COSTS**)
- consistency (**BETTER REPRODUCIBILITY, lower rejects**)
- quality (**HARDER AND BETTER CORROSION AND ABRASION RESISTANT ANODIC COATING**)

of the anodic layer.

This "system" consists of:

- a special rectifier (**HEA rectifier**) with changeable waveform
- a special additive for the sulphuric acid based solution (**HEA LIQUID ANODIZING ADDITIVE**)
- a special system of air agitation (micro-bubble "diffusion system")

THE RECTIFIER

The electrical current is supplied by a special machine able to give a pulsing current and

is fitted with a special APC computer (Anodizing Process Computer) to set and record:

- voltage
- current/current density
- temperature
- surface of each load

The machine reads the "electrochemical" area of the load and organises the proper current density (and voltage) of the anodic process **in order to achieve the thickness of the anodic layer chosen by the customer.**

The same current supply is suitable for:

- architectural anodizing
- hard anodizing for any type of alloy

The anodic layer can be coloured with any standard two step (electrocolouring) system in:

- tin based solutions
- nickel + tin solutions



- cobalt solution or with special colouring processes like **Greylox**, **Multicolour** or Interference colours.

THE COOLING SYSTEM

It is necessary to use a high efficiency system able to maintain the temperature at a fixed value (with a range of ± 1 °C) and to produce a correct circulation of the solution (a special pump is supplied).

AIR AGITATION (MICRO-BUBBLE SYSTEM)

A correct air agitation, produced by special diffusers, is necessary to dissipate the heat generated on the surface of the anodic layer by the effect of Joule.

A uniform stream of small-sized bubbles maintains the aluminium surface at the correct temperature.

THE ELECTROLYTE

The solution used for the anodizing process is composed of:

- 180 g/l sulphuric acid
- 36 g/l HEA additive

OPERATIONAL CONDITIONS

- Current density: 2.0 - 4.0 Amps/dm²
(Suggested 2-3 Amps/dm²)
- Temperature: 0 - 5 °C
for hard anodizing
19 - 20 °C
for architectural anodizing
- Speed of anodizing: according to the operative conditions (current density)

QUALITY OF THE ANODIC LAYER

The quality of the anodic layer is according to European and International specifications, including those concerning the characteristics of the anodic film (A.A.M.A. Specifications); the "colorability" of the anodic layer is perfect even when produced at extreme condition (i.e. high current density).

ADVANTAGES OF THE HEA PROCESS

- Good quality of the anodic film and uniform colour tones achieved by a standardized computer controlled process.
- Quick or high speed anodizing (e.g. 20 micron produced in 20 minutes) without problems of aspect on natural colour (no greyish or yellowish film typical of other high speed processes) or of colorability (usually high current density anodizing means green-greyish tones in electrocolouring and not consistency)
- Recorded characteristics and quality of the anodic process: the computer records (and prints) all the parameters of the process (like: voltage, current density, surface area, microns and temperature)
- Multicolour and Greylox processes achieve excellent results after this special anodizing process.
- A computerised network connection is available between the customer's machine and Italtecno's laboratory (optional).

