

Subject :

CONTINUOUS COIL ANODIZING

Proposal

“Specifications” Working Group

QUALANOD resolution:

Meetings in June and November 2005

Date of application:

1st January 2006

Amendments to the Specifications:

New Appendix VIII

APPENDIX VIII – Continuous Coil Anodizing (see following pages)

APPENDIX VIII - Continuous Coil Anodizing

Continuous coil anodizing is a special process where a coil of aluminium strip is unwound, fed through a series of process stations where etching, anodizing, colouring and sealing etc are carried out, and then rewound into coil at the end.

The process conditions and technologies are significantly different from the “normal” batch anodizing where discrete lengths of aluminium extrusion or sheet or small components such as castings are fixed to racks which are then transported by a crane and lowered sequentially into the different processing baths.

These conditions give the possibility to anodize more faster than “normal” batch anodizing, Generally the strip is passed through the line a such a speed that anodizing has to be carried out more rapidly than in batch anodizing.

Continuous coil anodizing can produce a product equivalent to that produced by batch anodizing. However, there are significant differences. Particular process control must be applied to produce a good quality product by continuous coil anodizing. Thus certain inter-related process parameters must be closely controlled and ensured to be uniform across the width of the strip. These are:

1. strip speed
2. anodizing acid flow rate at the strip surface
3. anodizing acid temperature
4. anodizing acid concentration
5. anodizing current density

Heat dissipation is effected by the differential movement of the strip and counter-flowed anodizing acid which is recirculated through a heat exchanger. Thus air agitation of the acid generally becomes unnecessary. Poor heat dissipation may lead to excessive attack of the anodic coating surface by the acid depending on the acid concentration. The coating becomes more porous and softer. It is known that anodic coatings with such characteristics may exhibit performance deficiencies during weathering. The strip speed determines the contact time in the anodizing solution and thus the current density must be adjusted to achieve the required anodic coating thickness. But high current density causes local heating of the acid, which then must be dissipated into the acid. Clearly, different combinations of the four parameters could be chosen that would give the required anodic coating thickness without producing an unacceptably soft coating.

The product tests of in-house control should be used to ensure that the chosen continuous coil anodizing conditions are producing the correct product quality.

IN HOUSE CONTROL

The same criteria used in chapter 4 must be applied with the following deviations:

1. Testing the anodizing baths (par. 4.1), bath temperature (4.2) and pH sealing bath (4.3)
 - once a day per anodizing line
2. Sealing (par. 4.4):
 - Dye spot test: once per coil
 - Weight loss test:
 - once a shift per sealing bath per line where coloured anodised coil are produced
 - once a day per sealing bath per line where clear anodised coil are produced

3. Thickness (par 4.5): Every coil must be checked at the beginning , in the middle and at the end.
4. Abrasion test (par. 4.6): the abrasion tests (section 2.4) are suited to detect whether a soft coating has been produced. The abrasion resistance should be measured for thickness classes 15 and greater. Every coil must be checked at the beginning , in the middle and at the end

INSPECTIONS

According to chapter 5 including at least:

- 1 weight loss test
- 150 thickness measuring points on
 - 3 running coils and
 - 9 coils on stock (or at least 1 coil of the stock and reference samples).