

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 2143

SURFACE TREATMENT OF METALS
ANODISATION OF ALUMINIUM AND ITS ALLOYS
ESTIMATION OF THE LOSS OF ABSORPTIVE POWER
BY COLORANT DROP TEST WITH PRIOR ACID TREATMENT

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 2143, *Surface treatment of metals – Anodisation of aluminium and its alloys – Estimation of the loss of absorptive power by colorant drop test with prior acid treatment*, was drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question led to the adoption of Draft ISO Recommendation No. 2143, which was circulated to all the ISO Member Bodies for enquiry in October 1970. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Austria	Italy	Sweden
Belgium	Japan	Switzerland
Canada	Netherlands	Thailand
Finland	New Zealand	Turkey
France	Norway	U.A.R.
Germany	Poland	United Kingdom
Hungary	Portugal	U.S.A.
India	South Africa, Rep. of	U.S.S.R.
Israel	Spain	

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

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**SURFACE TREATMENT OF METALS
ANODISATION OF ALUMINIUM AND ITS ALLOYS
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1. SCOPE

This ISO Recommendation defines a method for checking the sealing of oxide coatings obtained by anodisation (anodic oxidation) of aluminium and its alloys, by estimation of the loss of absorptive power by colorant drop test with prior acid treatment.

2. FIELD OF APPLICATION

This method is applicable to coatings of oxide intended for applications where they are exposed to the weather, or for protective purposes in corrosive media and where resistance to staining is important.

It is not applicable to coatings formed on alloys containing more than 2 % copper.

In the case of coatings coloured in deep shades, where an estimation of the intensity of the residual stain is difficult or impossible, only the prior acid treatment is used, and a check made as to whether or not the tint has been affected by this action.

In the case of integral colours (self colour) the test should be carried out completely.

3. PRINCIPLE

Action of an acid on a degreased area of the sample. Observation of the coloration obtained after the application of a colorant, interpretation being based on the fact that a sealed coating does not absorb the colour and is not attacked.

4. PROCEDURE

Carefully remove all grease from a defined area of the anodised sample with the aid of a suitable solvent, possibly followed by a light abrasive such as magnesia paste diluted in water, so that the surface is perfectly clean. After careful rinsing in running water, dip the degreased part of the sample into a 50 % (V/V) solution ($\rho_{20} = 1.24 \text{ g/ml}$) of nitric acid at a temperature of between 18 and 22 °C.

If immersion is not possible, place a few drops of the acid solution on a clearly defined area of the sample, so that this surface is entirely covered.

The duration of the treatment is 10 minutes.

NOTE. – The test can be carried out on tinted and untinted coatings.

After careful washing in running water, and drying, allow a drop of one of the solutions described below to fall on the treated area and remain there for 5 minutes :

- (A) 2 % alcoholic solution of methyl violet;
- (B) aqueous solution of aluminium green GLW, 10 g/l.

Solution A is used preferably for smooth or originally greasy surfaces, and solution B for rough surfaces. In the latter case, use a fresh solution for each series of tests.

Clean the surface by rubbing, under running water, with a cotton wad or a light abrasive (magnesia or whiting) for 2 minutes, and then in neutral soap solution. Then thoroughly rinse and dry the surface.

NOTE. – Methyl violet is a mixture of N-tetra, penta and hexamethyl-pararosanine hydrochlorates. The exact proportion of the components has no influence on this test.

Aluminium green GLW is a mixture of a sulphonic acid of leucocerulein and sodium bisulphite. (Colour Index, 2nd edition 1965, Part 1, page 1459, mordant green 50.)

5. EXPRESSION OF RESULTS

Examine the staining test area. The stain may be invisible or of an intensity given in the Annex as an example.

If no stain remains the sealing is good.

The tolerances on acceptable limits (specifications) are based on

- (a) a measure of the reflectivity by optical apparatus;
- (b) a more practical measurement comparing the stain produced with the example given in the Annex.