

# ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

## ISO RECOMMENDATION R 2085

SURFACE TREATMENT OF METALS  
ANODISATION OF ALUMINIUM AND ITS ALLOYS  
CHECK OF CONTINUITY OF THIN COATINGS  
COPPER SULPHATE TEST

1st EDITION

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## BRIEF HISTORY

The ISO Recommendation R 2085, *Surface treatment of metals – Anodisation of aluminium and its alloys – Check of continuity of thin coatings – Copper sulphate test*, 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. 2085, which was circulated to all the ISO Member Bodies for enquiry in July 1970. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Belgium	Israel	Spain
Canada	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Denmark	Netherlands	Thailand
Finland	New Zealand	U.A.R.
France	Norway	United Kingdom
Germany	Poland	U.S.A.
Greece	Portugal	U.S.S.R.
India	Romania	
Iran	South Africa, Rep. of	

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.

**SURFACE TREATMENT OF METALS**  
**ANODISATION OF ALUMINIUM AND ITS ALLOYS**

**CHECK OF CONTINUITY OF THIN COATINGS**

**COPPER SULPHATE TEST**

**1. SCOPE**

This ISO Recommendation defines a method of checking, by the copper sulphate test, the continuity of thin oxide coatings obtained by anodisation of aluminium and its alloys.

**2. FIELD OF APPLICATION**

The copper sulphate test enables a rapid check to be made of the continuity of a thin coating of aluminium oxide on aluminium and its alloys, i.e. in case of doubt regarding the presence of a visible fault on the surface of the coating, it makes it possible to verify whether such a fault corresponds to a local gap in the coating (bare metal).

The use of this method is limited to thin oxide coatings (less than 5  $\mu\text{m}$  thickness).

**3. PRINCIPLE**

The check is carried out on parts of surface area of about 100  $\text{mm}^2$ , chosen at will on the pieces, apart from the points of feed-in of the current. If the area includes points where the metal is either bare or poorly covered, chemical displacement of the copper takes place on the aluminium, accompanied by a release of gas. After the test, therefore, black spots can be seen where the coating is not continuous.

It is possible to examine the drop of the reagent which is applied, either with the naked eye or with a magnifying glass, immediately upon its application; the release of gas is almost instantaneous from points where the metal is bare.

**4. REAGENT**

Use a reagent of the following composition :

- <i>crystallized copper sulphate</i> ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) :	20 g
- <i>hydrochloric acid</i> , density 1.18 g/ml :	20 ml
- <i>distilled water</i> :	1000 ml

**5. PROCEDURE**

Remove all grease from the test pieces, by vapour degreasing. Mark out an area of about 100  $\text{mm}^2$  on a horizontal part using a wax crayon. Alternatively, use a rapidly drying lacquer to delineate the test area, leaving the test area itself unlacquered. Cover the area thus defined with four drops of the reagent. Leave the solution in contact with the surface for 5 minutes.

The room temperature should be  $20 \pm 5$   $^{\circ}\text{C}$ .

**6. EXPRESSION OF RESULTS**

After contact for 5 minutes, examine the surface and count the number of black spots per 100  $\text{mm}^2$ . For a more quantitative measurement, the average diameter of the black spots can also be estimated.