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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 196

METHOD OF MERCUROUS NITRATE TEST FOR COPPER AND COPPER ALLOYS

1st EDITION

May 1961

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 196, *Method of Mercurous Nitrate Test for Copper and Copper Alloys*, was drawn up by Technical Committee ISO/TC 26, *Copper and Copper Alloys*, the Secretariat of which was held by the American Standards Association, Inc. (ASA) until June 1960 and, since this date, by the Deutscher Normenausschuss (DNA).

In preparation for the first meeting of ISO/TC 26, held in Stockholm, in June 1955, the Secretariat presented a draft proposal concerning the subject of this ISO Recommendation. This document was examined during the meeting and then turned over to a Working Group for thorough study; the latter proposed a number of changes. The document was revised accordingly, and was approved by the Technical Committee, in plenary session, as a Draft ISO proposal. In November 1957, this draft proposal was circulated for vote by letter ballot to the members of the Technical Committee.

During its second meeting, held in Harrogate, in June 1958, the Technical Committee examined the results of the vote and the comments received, and prepared a revised draft proposal taking into account the amendments presented by various Member Bodies. On this basis, after full discussion, the draft proposal revised in this way was approved as a Draft ISO Recommendation.

On 26 June 1959, the Draft ISO Recommendation (No. 311) was distributed to all the ISO Member Bodies and was approved by the following Member Bodies:

Australia	Ireland	Poland
Belgium	Israel	Romania
Burma	Italy	Spain
Canada	Japan	Sweden
Chile	Mexico	Switzerland
Finland	Netherlands	Turkey
Germany	New Zealand	United Kingdom
Greece	Norway	U.S.A.
India	Portugal	Yugoslavia

One Member Body opposed the approval of the Draft: France

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in May 1961, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 196 May 1961

METHOD OF MERCUROUS NITRATE TEST FOR COPPER AND COPPER ALLOYS

1. SCOPE

This ISO Recommendation describes the technique for conducting the mercurous nitrate test of wrought copper and copper alloy products. It is an accelerated test for the purpose of detecting the presence of residual (internal) stresses that might bring about failure of the material in service or storage through stress corrosion cracking.

While this method has also been used for testing assemblies and partial assemblies, the method is not intended for that purpose, and some modification may be required for such use.

2. MERCUROUS NITRATE SOLUTION

2.1 **Concentration.** The solution is an aqueous mercurous nitrate solution containing 10 g of $HgNO_3$ and 10 ml of HNO_3 (density 1.40 to 1.42 g/cm³) per litre of solution.

2.2 This aqueous mercurous nitrate solution is to be prepared by either of the following procedures *A* or *B*.

2.2.1 *Procedure A.* Dissolve 11.4 g of $HgNO_3$, $2H_2O$ or 10.7 g of $HgNO_3$, H_2O in approximately 40 ml of distilled water, acidified with 10 ml of HNO_3. After the crystals are completely dissolved, dilute the solution with distilled water to 1000 ml.

2.2.2 *Procedure B.* Dissolve 76 g of mercury in 114 ml of diluted HNO_3 (one part water to one part HNO_3). Carefully dilute with distilled water to 1000 ml. This provides a concentration of 100 g of $HgNO_3$ per litre and an excess of 30 ml of HNO_3 after a slight loss due to heating. Add the water in small portions while stirring to prevent local over-dilution. This gradual dilution, together with the excess acid, will prevent precipitation of basic salts of mercury. Dilute 100 ml of this solution (10 per cent) with 7 ml of HNO_3 and 893 ml of water.

NOTES.

1. The mercurous nitrate crystals are obtainable in both the monohydrate and dihydrate form and should be handled with caution because of their highly toxic effects. When weighing crystals, the weight of the water of crystallization should be taken into consideration. The mercurous nitrate crystals are photosensitive and when they have turned yellow are difficult to dissolve.
2. If heating is used in either of these procedures for preparing the mercurous nitrate solution, care should be exercised to avoid loss of HNO_3.

3. TEST PIECE

3.1 The length of the test piece should be at least 6 in (150 mm) for products up to and including 3 in (75 mm) in diameter. For larger products, the length should be subject to agreement.

3.2 Test pieces for the mercurous nitrate test should not be marked for identification by stamping.