
INTERNATIONAL STANDARD



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Aluminium and aluminium alloys — Determination of manganese — Photometric method (Manganese content between 0,005 and 1,5 %)

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, International Standard ISO 886 replaces ISO Recommendation R 886-1968 drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*.

The Member Bodies of the following countries approved the Recommendation :

Australia	Hungary	Spain
Austria	Ireland	Sweden
Belgium	Israel	Switzerland
Canada	Italy	Thailand
Chile	Japan	Turkey
Czechoslovakia	Netherlands	U.S.A.
France	Norway	U.S.S.R.
Germany	Poland	Yugoslavia
Greece	South Africa, Rep. of	

The Member Body of the following country expressed disapproval of the Recommendation on technical grounds :

United Kingdom

Aluminium and aluminium alloys – Determination of manganese – Photometric method (Manganese content between 0,005 and 1,5 %)

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a photometric method for the determination of manganese in aluminium and aluminium alloys.

The method is applicable to the determination of manganese content between 0,005 and 1,5 %.

The method does not apply completely to the following special cases :

- a) alloys with a silicon content higher than 10 % and a manganese content less than 0,1 % (see Annex);
- b) aluminium alloys containing tin, antimony, bismuth, zirconium, etc. (In this International Standard these special cases are not treated.)

2 PRINCIPLE

Attack of the sample with sodium hydroxide. Acidification by sulphuric and nitric acids.

Oxidation of manganese(II) to manganese(VII) by means of potassium periodate (acidity of solution over 3,5 N approximately), in the presence of phosphoric acid.

Photometric measurement at a wavelength of about 525 nm.

3 REAGENTS

For the preparation of solutions and during the analysis, use doubly distilled water.

3.1 Water free from reducing agents

Heat to boiling, water acidified with 10 ml per litre of the sulphuric acid (3.4); add a few crystals of potassium periodate (KIO_4) and continue boiling for about 10 min.

3.2 Sodium hydroxide, 200 g/l solution.

In a nickel dish dissolve 200 g of sodium hydroxide (NaOH) in water and, after cooling, make up the volume to 1 000 ml. Keep in a plastics container.

3.3 Sulphurous acid solution

Pass a current of sulphur dioxide gas (SO_2) through water until saturation point is reached.

3.4 Sulphuric acid, ρ 1,48 g/ml, approximately 17,5 N solution.

Carefully add 500 ml of sulphuric acid (ρ 1,84 g/ml), approximately 35,6 N, to water, cool and make up the volume to 1 000 ml.

3.5 Sulphuric acid, ρ 1,84 g/ml, approximately 35,6 N solution

3.6 Nitric acid, ρ 1,40 g/ml, approximately 15 N solution.

3.7 Hydrofluoric acid, 40 % (m/m) solution (ρ approximately 1,14 g/ml)

3.8 Fluoroboric acid solution

In a plastics flask mix 800 ml of saturated boric acid solution at 20 °C with 200 ml of the hydrofluoric acid (3.7).

3.9 Phosphoric acid, ρ 1,71 g/ml, approximately 45 N solution.

3.10 Potassium periodate, 50 g/l solution.

Dissolve 50 g of potassium periodate (KIO_4) in water, add 200 ml of the nitric acid (3.6) and make up the volume to 1 000 ml with water.

3.11 Sodium nitrite, 20 g/l solution.

Dissolve 2 g of sodium nitrite (NaNO_2) in a little water and make up the volume to 100 ml.