INTERNATIONAL STANDARD 796

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Aluminium alloys — Determination of copper — Electrolytic method

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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 796 replaces ISO Recommendation R 796-1968 drawn up by Technical Committee ISO/TC 79, *Lights metals and their alloys.*

The Member Bodies of the following countries approved the Recommendation :

Argentina	Germany	Poland
Austria	Hungary	South Africa, Rep. of
Belgium	Korea, Rep. of	Spain
Brazil	India	Sweden
Bulgaria	Ireland	Switzerland
Canada	Israel	Turkey
Chile	Italy	United Kingdom
Czechoslovakia	Japan	U.S.S.R.
Egypt, Arab Rep. of	Netherlands	Yugoslavia
France	Norway	

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

U.S.A.*

* Subsequently, this Member Body approved the Recommendation.

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Aluminium alloys — Determination of copper — Electrolytic method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies an electrolytic method for the determination of copper in aluminium alloys.

The method is applicable to the determination of copper content greater than or equal to 0,50 %.

The method does not apply completely to the following special cases for which it should be modified as described in Annex A or Annex B :

a) alloys containing tin or antimony (see Annex A);

b) alloys containing bismuth (see Annex B).

2 PRINCIPLE

Attack with a mixture of perchloric acid and nitric acid.

Dehydration of the silica in a perchloric medium and filtration of the insoluble residue.

Volatilization of the siliceous residue and recovery of copper from the residue.

Electrolysis of the solution after addition of nitric acid.

3 REAGENTS

3.1 Ethanol, ρ approximately 0,816 g/ml, 95 % (*V/V*) solution.

3.2 Sulphamic acid (NH_2SO_3H).

3.3 Hydrobromic acid, ρ approximately 1,49 g/ml, 48 % (*V/V*) solution.

3.4 Hydrochloric acid, ρ 1,1 g/ml, approximately 6 N solution.

Take 500 ml of hydrochloric acid (ρ 1,19 g/ml), approximately 12 N and make up the volume to 1 000 ml with water.

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

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

3.7 Nitric acid, ρ 1,23 g/ml, approximately 7,4 N solution.

Take 500 ml of nitric acid (3.6) and make up the volume to 1 000 ml with water.

3.8 Perchloric acid, ρ 1,67 g/ml, approximately 11,7 N solution.

(Perchloric acid, ρ 1,54 g/ml (approximately 9 N), can also be used. 1 000 ml of perchloric acid (ρ 1,67 g/ml), is equivalent to 1 270 ml of perchloric acid (ρ 1,54 g/ml).)

3.9 Perchloric acid, ρ 1,33 g/ml approximately 5,8 N solution.

Take 500 ml of perchloric acid (3.8) and make up the volume to 1 000 ml with water.

3.10 Sulphuric acid, ρ 1,33 g/ml (approximately 11,7 N).

Carefully add 35 ml of sulphuric acid (ρ 1,84 g/ml) to water and, after cooling, make up the volume to 100 ml.

3.11 Tartaric acid, 300 g/l solution.

Dissolve 300 g of tartaric acid ($C_4H_6O_6$) in a little water and make up the volume to 1 000 ml.

3.12 Ammonia, ρ 0,95 g/ml solution (approximately 7 N).

Take 500 ml of ammonia solution, ρ 0,90 g/ml (approximately 14,4 N), and make up the volume to 1 000 ml with water.

3.13 Bromine water, saturated solution.

3.14 Formic mixture :

Formic acid, ρ 1,20 g/ml (approximately 24 N)	20 ml	made up to 100 ml with water
Ammonia solution, ρ 0,90 g/ml (approximately 14,4 N)	3 ml	

Dilute 20 ml of formic acid (HCOOH) with about 50 ml of water, add 3 ml of ammonia solution and make up the volume to 100 ml with water.