INTERNATIONAL STANDARD 3750

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Zinc alloys — Determination of magnesium content — Atomic absorption method

Alliages de zinc — Dosage du magnésium — Méthode par absorption atomique

First edition — 1976-09-30

UDC 669.55 : 546.46 : 543.422

Ref. No. ISO 3750-1976 (E)

Descriptors : zinc alloys, chemical analysis, determination of content, magnesium, atomic absorption spectroscopic analysis.

Price based on 2 pages

FOREWORD

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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.

International Standard ISO 3750 was drawn up by Technical Committee ISO/TC 18, *Zinc and zinc alloys*, and was circulated to the Member Bodies in June 1975.

It has been approved by the Member Bodies of the following countries :

Australia	Germany	South Africa, Rep. of
Austria	India	Spain
Belgium	Ireland	Turkey
Brazil	Italy	United Kingdom
Canada	Japan	U.S.S.R.
Czechoslovakia	Mexico	Yugoslavia
Egypt, Arab Rep. of	Norway	
France	Poland	

No Member Body expressed disapproval of the document.

Printed in Switzerland

Zinc alloys — Determination of magnesium content — Atomic absorption method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies an atomic absorption method for the determination of the magnesium content of zinc alloys.

This method is applicable to the zinc alloys defined in ISO/R 301. It is suitable for the determination of magnesium contents between 0,01 and 0,08 %.

2 REFERENCES

ISO/R 301, *Zinc alloy ingots.*

ISO 3752, *Zinc alloy ingots — Selection and preparation of samples for chemical analysis.*

3 PRINCIPLE

Dissolution of a test portion in a hydrochloric acid-nitric acid medium. Suitable dilution and addition of a lanthanum salt to attenuate the effect of aluminium.

Atomization of the solution in an air-acetylene (or nitrous oxide-acetylene) flame and determination of magnesium content by spectrophotometric measurement of the atomic absorption at the wavelength 285,21 nm emitted by a magnesium hollow-cathode lamp.

4 REAGENTS

All reagents shall be of analytical reagent grade. Distilled water or demineralized water of equivalent purity shall be used for preparing the solutions.

4.1 Hydrochloric acid, ρ 1,19 g/ml.

4.2 Nitric acid, ρ 1,4 g/ml.

4.3 Hydrochloric acid-nitric acid mixture.

Mix 180 ml of the hydrochloric acid (4.1) and 4 ml of the nitric acid (4.2).

4.4 Lanthanum, 5 % solution.

Dissolve 29,5 g of lanthanum oxide (La_2O_3) in 25 ml of the hydrochloric acid (4.1). Transfer the solution quantitatively to a 500 ml volumetric flask. Dilute to the mark with water. Mix.

4.5 Zinc, 10 g/l solution.

Attack 10 g of zinc (99,99 %), free from magnesium[1], with 60 ml of the acid mixture (4.3). Evaporate to a syrupy consistency. Take up with water and transfer quantitatively to a 1 000 ml volumetric flask. Dilute to the mark with water. Mix.

4.6 Aluminium, 0,8 g/l solution.

Attack 0,8 g of aluminium (99,99 %), free from magnesium[1], with the minimum of hydrochloric acid (4.1). Transfer quantitatively to a 1 000 ml volumetric flask. Dilute to the mark with water. Mix.

4.7 Magnesium, standard solution corresponding to 0,5 g of Mg per litre.

Into a 250 ml beaker covered with a watch-glass, pour 20 ml of water, then 5 ml of the hydrochloric acid (4.1). Introduce 0,5 g of magnesium of purity at least 99,95 %, weighed to ± 0,001 g. After dissolution of the metal, cool and transfer quantitatively to a 1 000 ml volumetric flask. Dilute to the mark with water. Mix.

1 ml of this standard solution contains 0,5 mg of magnesium.

1) To check that the magnesium content of solution (4.5) or (4.6) is low enough, proceed as follows :

Introduce into two 100 ml volumetric flasks 0 and 0,5 ml respectively of the standard magnesium solution (4.8) corresponding to 0 and 0,05 mg/l of magnesium.

Dilute to the mark with water. Mix.

Compare solution (4.5) or (4.6) with these calibration solutions by spectrophotometric measurement of the atomic absorption as specified in 7.4.

The response shall not exceed that of the solution 0,05 mg/l.