# INTERNATIONAL STANDARD ISO 5791



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# Ammonium nitrate for industrial use — Determination of water content — Karl Fischer method

*Nitrate d'ammonium à usage industriel — Dosage de l'eau — Méthode de Karl Fischer*

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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.

International Standard ISO 5791 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in September 1977.

It has been approved by the member bodies of the following countries :

| | | |
|---|---|---|
| Australia | Hungary | Portugal |
| Austria | India | Romania |
| Belgium | Israel | South Africa, Rep. of |
| Bulgaria | Italy | Switzerland |
| Chile | Kenya | Turkey |
| Czechoslovakia | Korea, Rep. of | United Kingdom |
| Egypt, Arab Rep. of | Netherlands | U.S.S.R. |
| France | Philippines | Yugoslavia |
| Germany, F.R. | Poland | |

No member body expressed disapproval of the document.

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).



Printed in Switzerland

# Ammonium nitrate for industrial use — Determination of water content — Karl Fischer method

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a procedure for the determination of the water content of ammonium nitrate for industrial use by the Karl Fischer method.

The method is applicable to products having water contents equal to or greater than 0,05 % (*m/m*).

## 2 REFERENCE

ISO 760, *Determination of water content — Karl Fischer method.*

## 3 PRINCIPLE

Reaction of water with a solution of iodine and sulphur dioxide in a pyridine-methanol mixture (Karl Fischer reagent). This reagent is standardized previously by titration of an exactly known mass of water. Detection of the end point of the reaction by the direct electrometric method.

## 4 REAGENTS

During the analysis, use only reagents of recognized analytical grade.

See ISO 760, clause 4, and in particular sub-clauses 4.1 — 4.3 — 4.5 — 4.6 — 4.7 — 4.8 — 4.9 and 4.10.

## 5 APPARATUS

See ISO 760, sub-clause 5.1.

## 6 PROCEDURE

### 6.1 Test portion

According to the expected water content, weigh, to the nearest 0,01 g, a test portion requiring not more than 20 ml of the Karl Fischer reagent, and, in any case, of mass less than or equal to 10 g.

### 6.2 Standardization of the Karl Fischer reagent

Refer to ISO 760, sub-clause 7.2.1 (direct electrometric titration).

### 6.3 Determination

Refer to ISO 760, sub-clause 7.2.2 (direct electrometric titration); use 50 ml of the pure methanol (4.1).

NOTE — The electrometric back-titration method (ISO 760, clause 8), which gives more accurate results, may also be used where appropriate.

## 7 EXPRESSION OF RESULTS

### 7.1 Water equivalent $T$ of the Karl Fischer reagent (4.5)

Refer to ISO 760, sub-clause 7.3.1.

### 7.2 Water content of the sample

The water content, expressed as a percentage by mass of $H_2O$, is given by the formula

$$\frac{V \times T \times 100}{m \times 1\,000} = \frac{V \times T}{10\,m}$$

where

$V$ is the volume, in millilitres, of the Karl Fischer reagent used in the determination;

$T$ is the water equivalent, in milligrams per millilitre, of the Karl Fischer reagent (see 7.1);

$m$ is the mass, in grams, of the test portion (6.1).

## 8 TEST REPORT

The test report shall include the following particulars :

a) an identification of the sample;

b) the reference of the method used;

c) the results and the method of expression used;

d) any unusual features noted during the determination;

e) any operation not included in this International Standard or in the International Standard to which reference is made, or regarded as optional.

ANNEX

## ISO PUBLICATIONS RELATING TO AMMONIUM NITRATE FOR INDUSTRIAL USE

ISO 2364 — Determination of free acidity — Volumetric method.

ISO 2365 — Measurement of pH value — Potentiometric method.

ISO 2995 — Determination of matter insoluble in water — Gravimetric method.

ISO 3329 — Determination of sulphate content — Method by reduction and titrimetry.

ISO 3330 — Determination of ammoniacal nitrogen content — Titrimetric method after distillation.

ISO 3331 — Determination of total nitrogen content — Titrimetric method after distillation.

ISO 3695 — Determination of chloride ions content — Potentiometric method.

ISO 5791 — Determination of water content — Karl Fischer method.