

---

# INTERNATIONAL STANDARD



# 2990

---

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

---

## Nitric acid for industrial use — Evaluation of the nitric acid concentration by measurement of density

*Acide nitrique à usage industriel — Évaluation de la concentration en acide nitrique par mesurage de la masse volumique*

First edition — 1974-04-01

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO 2990:1974](#)

<https://standards.iteh.ai/catalog/standards/sist/a6f4d1b5-03e2-4749-871e-64fb45487153/iso-2990-1974>



---

UDC 661.56 : 546.175-323 : 542.3

Ref. No. ISO 2990-1974 (E)

**Descriptors** : nitric acid, chemical analysis, determination of content, concentration (composition), density (mass/volume), measurement.

## 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 2990 was drawn up by Technical Committee ISO/TC 47, *Chemistry*, and circulated to the Member Bodies in November 1972.

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

|                     |                       |                |
|---------------------|-----------------------|----------------|
| Australia           | India                 | Spain          |
| Austria             | Israel                | Sweden         |
| Belgium             | Italy                 | Switzerland    |
| Bulgaria            | Netherlands           | Thailand       |
| Czechoslovakia      | New Zealand           | Turkey         |
| Egypt, Arab Rep. of | Poland                | United Kingdom |
| France              | Portugal              | U.S.S.R.       |
| Germany             | Romania               |                |
| Hungary             | South Africa, Rep. of |                |

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

No Member Body expressed disapproval of the document.

# Nitric acid for industrial use – Evaluation of the nitric acid concentration by measurement of density

## iTeh STANDARD PREVIEW (standards.iteh.ai)

### 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the approximate evaluation, by measurement of density, of the concentration of nitric acid for industrial use.

ISO 2990:1974

comes to rest, re-check that the temperature of the acid is  $20 \pm 0,5$  °C. Read off the density indicated on the hydrometer scale.

### 2 PRINCIPLE

Determination of the density at 20 °C by means of a hydrometer. Evaluation of the corresponding concentration of nitric acid (HNO<sub>3</sub>).

### 3 APPARATUS

Ordinary laboratory apparatus and

**3.1 Density hydrometer**, graduated in 0,005 g/ml, calibrated at 20 °C. (See ISO/R 649.)

**3.2 Glass cylinder**, capacity at least 500 ml, diameter at least 25 mm greater than that of the density hydrometer and height at least 25 mm greater than the immersion level of the density hydrometer.

### 4 PROCEDURE

#### 4.1 Determination of density

Place about 500 ml of the test sample in a glass cylinder, and bring the contents to a temperature of  $20 \pm 0,5$  °C. Place the hydrometer (3.1) in the cylinder and, when it

#### 4.2 Evaluation of the nitric acid concentration

Read from the table the concentration of nitric acid corresponding to the density indicated by the hydrometer.

### 5 EXPRESSION OF RESULTS

State the density, expressed in grams per millilitre, read on the hydrometer and the nitric acid concentration deduced from the table.

### 6 TEST REPORT

The test report shall include the following particulars :

- the reference of the method used;
- the results and the method of expression used;
- any unusual features noted during the determination;
- any operation not included in this International Standard, or regarded as optional.

TABLE — Correspondence between density and concentration of aqueous solutions of nitric acid

| Density at 20 °C | HNO <sub>3</sub> | Density at 20 °C | HNO <sub>3</sub> |
|------------------|------------------|------------------|------------------|
| g/ml             | %(m/m)           | g/ml             | %(m/m)           |
| 1,005            | 1,25             | 1,265            | 42,90            |
| 1,010            | 2,20             | 1,270            | 43,70            |
| 1,015            | 3,10             | 1,275            | 44,50            |
| 1,020            | 4,00             | 1,280            | 45,25            |
| 1,025            | 4,90             | 1,285            | 46,05            |
| 1,030            | 5,80             | 1,290            | 46,85            |
| 1,035            | 6,65             | 1,295            | 47,60            |
| 1,040            | 7,55             | 1,300            | 48,40            |
| 1,045            | 8,40             | 1,305            | 49,15            |
| 1,050            | 9,25             | 1,310            | 50,00            |
| 1,055            | 10,10            | 1,315            | 50,85            |
| 1,060            | 10,95            | 1,320            | 51,70            |
| 1,065            | 11,80            | 1,325            | 52,50            |
| 1,070            | 12,65            | 1,330            | 53,40            |
| 1,075            | 13,50            | 1,335            | 54,25            |
| 1,080            | 14,30            | 1,340            | 55,10            |
| 1,085            | 15,15            | 1,345            | 56,00            |
| 1,090            | 15,95            | 1,350            | 56,90            |
| 1,095            | 16,75            | 1,355            | 57,80            |
| 1,100            | 17,60            | 1,360            | 58,75            |
| 1,105            | 18,40            | 1,365            | 59,70            |
| 1,110            | 19,20            | 1,370            | 60,65            |
| 1,115            | 20,00            | 1,375            | 61,60            |
| 1,120            | 20,80            | 1,380            | 62,65            |
| 1,125            | 21,60            | 1,385            | 63,65            |
| 1,130            | 22,40            | 1,390            | 64,70            |
| 1,135            | 23,15            | 1,395            | 65,80            |
| 1,140            | 23,95            | 1,400            | 66,90            |
| 1,145            | 24,70            | 1,405            | 68,05            |
| 1,150            | 25,50            | 1,410            | 69,20            |
| 1,155            | 26,25            | 1,415            | 70,40            |
| 1,160            | 27,00            | 1,420            | 71,55            |
| 1,165            | 27,75            | 1,425            | 72,80            |
| 1,170            | 28,50            | 1,430            | 74,05            |
| 1,175            | 29,25            | 1,435            | 75,35            |
| 1,180            | 30,00            | 1,440            | 76,65            |
| 1,185            | 30,75            | 1,445            | 78,00            |
| 1,190            | 31,50            | 1,450            | 79,40            |
| 1,195            | 32,25            | 1,455            | 80,85            |
| 1,200            | 33,00            | 1,460            | 82,35            |
| 1,205            | 33,70            | 1,465            | 83,85            |
| 1,210            | 34,40            | 1,470            | 85,45            |
| 1,215            | 35,15            | 1,475            | 87,20            |
| 1,220            | 35,90            | 1,480            | 89,00            |
| 1,225            | 36,70            | 1,485            | 91,00            |
| 1,230            | 37,45            | 1,490            | 93,40            |
| 1,235            | 38,25            | 1,495            | 95,90            |
| 1,240            | 39,00            | 1,500            | 97,75            |
| 1,245            | 39,80            | 1,505            | 98,85            |
| 1,250            | 40,60            | 1,510            | 99,60            |
| 1,255            | 41,35            | 1,513            | 100,00           |
| 1,260            | 42,15            |                  |                  |

STANDARD PREVIEW  
(standards.iteh.ai)

ISO 2990:1974  
<https://standards.iteh.ai/catalog/standards/sist/a6f4d110-03e2-4749-871e-64fb45487153/iso-2990-1974>

The intermediate values given in the table have been calculated, by graphical interpolation, from the values quoted in *International Critical Tables*, 1st edition, Volume 3, page 58.

## ANNEX

This document forms part of the following series on methods of test for nitric acid for industrial use :

ISO/R 1980 – *Determination of total acidity – Volumetric method.*

ISO/R 1981 – *Determination of nitrous compounds – Volumetric method.*

ISO/R 1982 – *Determination of iron content – 2,2'-bipyridyl photometric method.*

ISO/R 1983 – *Determination of sulphated residue on ignition – Gravimetric method.*

ISO 2990 – *Evaluation of the nitric acid concentration by measurement of density.*

ISO 2991 – *Determination of ammoniacal nitrogen content – Spectrophotometric method.*

ISO 3328 – *Determination of sulphate content – Titrimetric method after reduction.<sup>1)</sup>*

## iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 2990:1974

<https://standards.iteh.ai/catalog/standards/sist/a6f4d1b5-03e2-4749-871e-64fb45487153/iso-2990-1974>

<sup>1)</sup> At present at the stage of draft.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

This page intentionally left blank

[ISO 2990:1974](#)

<https://standards.iteh.ai/catalog/standards/sist/a6f4d1b5-03e2-4749-871e-64fb45487153/iso-2990-1974>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

This page intentionally left blank

[ISO 2990:1974](#)

<https://standards.iteh.ai/catalog/standards/sist/a6f4d1b5-03e2-4749-871e-64fb45487153/iso-2990-1974>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

This page intentionally left blank

[ISO 2990:1974](#)

<https://standards.iteh.ai/catalog/standards/sist/a6f4d1b5-03e2-4749-871e-64fb45487153/iso-2990-1974>