
International Standard



1388/10

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Ethanol for industrial use — Methods of test — Part 10 : Estimation of hydrocarbons content — Distillation method

Éthanol à usage industriel — Méthodes d'essai — Partie 10 : Évaluation des hydrocarbures — Méthode par distillation

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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 1388/10 was developed by Technical Committee ISO/TC 47, *Chemistry*, and was circulated to the member bodies in February 1980.

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

Australia	France	Philippines
Austria	Germany, F.R.	Poland
Belgium	Hungary	Romania
Brazil	India	South Africa, Rep. of
Bulgaria	Italy	Switzerland
China	Korea, Rep. of	Thailand
Czechoslovakia	Netherlands	USSR

The member body of the following country expressed disapproval of the document on technical grounds :

United Kingdom

International Standards ISO 1388/1 to ISO 1388/12 cancel and replace ISO Recommendation R 1388-1970, of which they constitute a technical revision.

Ethanol for industrial use — Methods of test — Part 10 : Estimation of hydrocarbons content — Distillation method

1 Scope and field of application

This part of ISO 1388 specifies a distillation method for estimating the hydrocarbons content of ethanol for industrial use.

This document should be read in conjunction with ISO 1388/1 (see the annex).

2 Principle

Distillation of a test portion in the presence of water, addition to the distillate of a saturated sodium chloride solution and measurement of the volume of insoluble hydrocarbons.

3 Reagent

During the analysis, use only reagent of recognized analytical grade, and distilled water or water of equivalent purity.

3.1 Sodium chloride, saturated solution at ambient temperature.

4 Apparatus

Ordinary laboratory apparatus, and

4.1 Distillation flask, round-bottomed, of capacity 4 000 ml.

4.2 Hempel fractionating column, height of filling 230 mm, such as that shown in figure 1, filled with glass beads of diameter between 10 and 12 mm.

4.3 Liebig condenser, nominal jacket length 400 mm, fitted with a ground glass adaptor.

4.4 Receiver for the estimation of hydrocarbons content, such as that shown in figure 2.

5 Procedure

5.1 Test portion

Take $1\,500 \pm 1$ ml of the laboratory sample.

5.2 Determination

Place the test portion (5.1) in the distillation flask (4.1) and add 1 500 ml of water. Connect the fractionating column (4.2) to the flask and connect the side arm to the Liebig condenser (4.3) fitted with its adaptor. Heat the flask so that the rate of distillation does not exceed 30 drops per minute and collect the distillate in the receiver (4.4). When the distillate reaches the mark on the constricted part of the receiver (about 13 ml of distillate) stop the distillation. Add sufficient of the sodium chloride solution (3.1) to the receiver so that the liquid level lies between the 1 and 2 ml graduations.

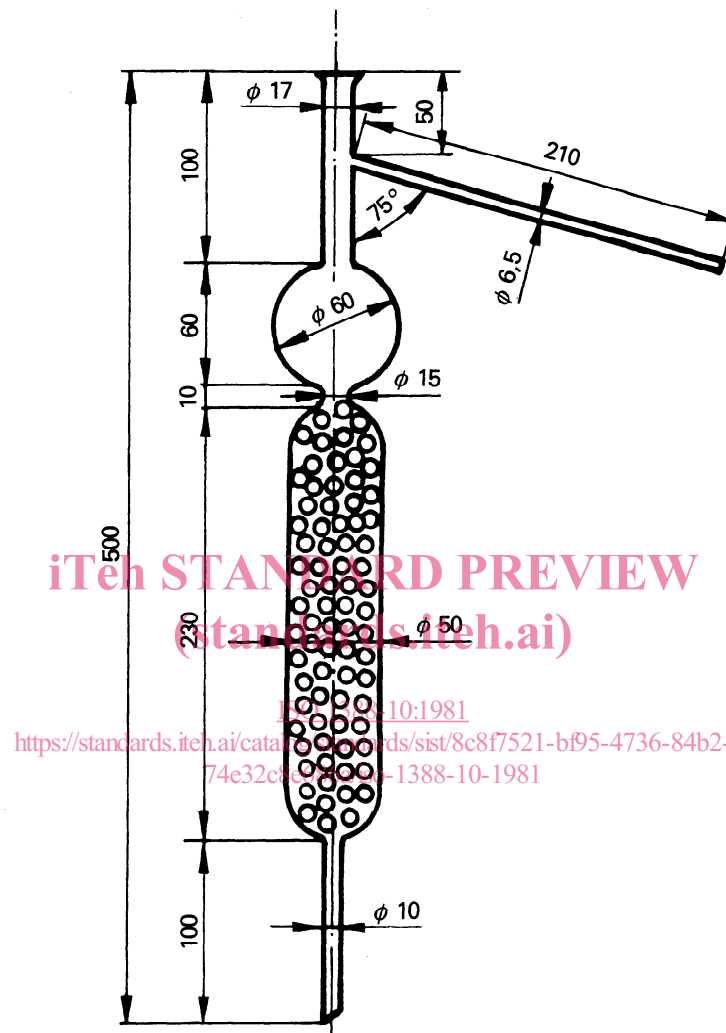
Mix the contents of the receiver by rotating it, taking care not to turn it upside down. Allow to stand until the liquid has separated into layers. If necessary, again rotate the receiver so as to detach any drops of the hydrocarbon phase adhering to the walls of the receiver. Read the volume of the upper layer on the graduated scale of the receiver.

6 Expression of results

Using the graph in figure 3, obtain the hydrocarbons content, expressed as a percentage by volume, corresponding to the volume of liquid in the upper layer (5.2).

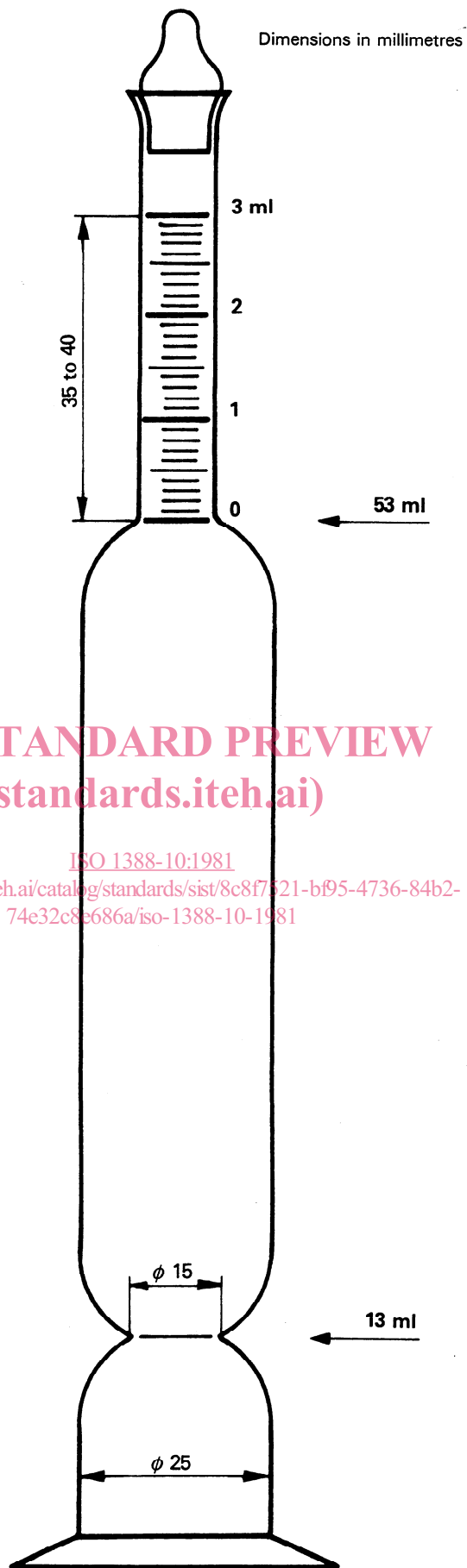
NOTE — Figure 3 is an empirical graph which reflects the fact that the entire hydrocarbons content of the sample does not distil out within the first 13 ml of distillate. The graph is non-linear because the distillation rate of hydrocarbons from the sample is not proportional to the hydrocarbons content.

Dimensions in millimetres



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Figure 1 — Hempel fractionating column (4.2)



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Figure 2 — Receiver for the estimation of hydrocarbons content (4.4)



Figure 3 — Graph for estimation of hydrocarbons content

Annex

ISO Publications relating to ethanol for industrial use

ISO 1388/1 — General.

ISO 1388/2 — Detection of alkalinity or determination of acidity to phenolphthalein.

ISO 1388/3 — Estimation of content of carbonyl compounds present in small amounts — Photometric method.

ISO 1388/4 — Estimation of content of carbonyl compounds present in moderate amounts — Titrimetric method.

ISO 1388/5 — Determination of aldehydes content — Visual colorimetric method.

ISO 1388/6 — Test for miscibility with water.

ISO 1388/7 — Determination of methanol content [methanol contents between 0,01 and 0,20 % (V/V)] — Photometric method.

ISO 1388/8 — Determination of methanol content [methanol contents between 0,10 and 1,50 % (V/V)] — Visual colorimetric method.

ISO 1388/9 — Determination of esters content — Titrimetric method after saponification.

ISO 1388/10 — Estimation of hydrocarbons content — Distillation method.

ISO 1388/11 — Test for detection of furfural.

ISO 1388/12 — Determination of permanganate time.

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