International Standard 4801

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

Glass alcoholometers and alcohol hydrometers not incorporating a thermometer

Alcoomètres et aréomètres pour alcool, sans thermomètre incorporé

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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 4801 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, and was circulated to the member bodies in November 1977.

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

Australia	India	South Africa, Rep. of
Brazil	Israel	Spain
Czechoslovakia	Italy	Turkey
Egypt, Arab Rep. of	Mexico	United Kingdom
France	Netherlands	USSR
Germany, F.R.	Poland	Yugoslavia
Hungary	Romania	

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

USA

Printed in Switzerland

Glass alcoholometers and alcohol hydrometers not incorporating a thermometer

1 SCOPE AND FIELD OF APPLICATION

This International Standard sets forth the requirements for three different types of glass instrument, not incorporating a thermometer, suitable for the accurate determination of the ethanol content of simple mixtures of ethanol and water, namely

— type 1 : alcoholometers graduated in percentage of ethanol by volume at 20 °C;

— type 2 : alcoholometers graduated in percentage of ethanol by mass;

— type 3 : alcohol hydrometers graduated in units of density (kilograms per cubic metre) at 20 °C.

Two classes of accuracy are specified for types 1 and 2 and one class for type 3.

Alcoholometers and alcohol hydrometers with an incorporated thermometer are dealt with in ISO 4805[1)].

2 DEFINITIONS

2.1 alcoholometer : An instrument which indicates

— the alcoholic strength by mass, or

— the alcoholic strength by volume,

of a mixture of water and ethanol.

2.2 alcohol hydrometer : An instrument designed to measure the density of a mixture of water and ethanol.

2.3 ethanol content of an ethanol-water mixture as a percentage by volume [% (*V/V*)] **at 20 °C :** The number of volumes of ethanol at 20 °C required to form 100 volumes of that mixture at 20 °C.

NOTE — In countries where the relevant regulations require it, the expression "% vol" may replace the expression "% (*V/V*)".

2.4 ethanol content of an ethanol-water mixture as a percentage by mass [% (*m/m*)] : The number of units of mass of ethanol required to form 100 units of mass of that mixture.

NOTE — In countries where the relevant regulations require it, the expression "% mass" may replace the expression "% (*m/m*)".

2.5 density of an ethanol-water mixture at 20 °C : The mass of unit volume of the mixture at 20 °C. It is expressed in kilograms per cubic metre.

3 BASIS OF SCALE

The basis of the scale of each type of instrument is as follows :

— Type 1 alcoholometers : ethanol content as a percentage by volume at 20 °C.

— Type 2 alcoholometers : ethanol content as a percentage by mass.

— Type 3 alcohol hydrometers : density at 20 °C.

The basis of the scales of the type 1 and type 2 hydrometers shall be the tables of density versus composition of ethanol solution published with the approval of the International Organization of Legal Metrology.

4 CLASSIFICATION

Two classes of accuracy are specified, as shown in table 1.

TABLE 1 — **Classes of accuracy**

Class	Minimum mean distance between centres of adjacent graduation lines mm	Type
1	1,5	1, 2, 3
2	1,05	1, 2

5 REFERENCE TEMPERATURE

The reference temperature for all three types of instrument shall be 20 °C.

6 REFERENCE LEVEL FOR READING

The instruments shall be graduated for reading at the level of the free horizontal surface of the liquid.

1) At present at the stage of draft.