International Standard 7057

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Plastics laboratory ware — Filter funnels

Matériel de laboratoire en plastique — Entonnoirs pour filtration

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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 7057 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, and was circulated to the member bodies in May 1980.

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

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

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

India

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Plastics laboratory ware — Filter funnels

0 Introduction

This International Standard has been prepared to align the requirements for plastics filter funnels with those for glass filter funnels which will form the subject of ISO 4798. In both cases, the requirements have been based on the sizes of filter papers currently available, i.e. diameters 55 — 70 — 90 — 110 — 125 — 150 — 185 and 240 mm.

Differences between the requirements for plastics and glass filter funnels have been limited, as far as possible, to those arising from the differences in physical properties of the respective materials used in their construction.

The requirements are applicable to filter funnels intended for use with aqueous solutions at temperatures between 0 and 60 °C. Before using these filter funnels for strong acids and alkalis, oxidizing agents or non-aqueous liquids, or at temperatures outside this temperature range, users should satisfy themselves that the filter funnels are suitable for such applications either by laboratory tests or by reference to the manufacturer or supplier. Plastics filter funnels complying with the requirements of this International Standard are marked both with a recommended maximum temperature of use and an indication of the material of construction.

1 Scope and field of application

This International Standard specifies requirements for six preferred sizes of plastics filter funnels up to 200 mm in diameter suitable for laboratory use.

2 Sizes

The preferred sizes of filter funnels are defined by their internal bowl diameters as follows :

35 — 55 — 75 — 100 — 150 and 200 mm.

The tolerance on diameter shall be ± 5 %.

General designs of filter funnels are shown in the figure.

3 Material

3.1 General

Filter funnels shall be rigidly constructed of generally non-brittle plastics material of suitable chemical and thermal properties, and shall be as free as possible from moulding defects and stress.

3.2 Resistance to extraction of ionic material by water at 60 °C

When tested by the method specified in annex A, the funnel shall give an aqueous extract free of suspended matter, and having a conductivity not more than 200 µS/m greater than that of the original water used for the extraction.

NOTE — 200 µS/m is equivalent to the conductivity of water containing approximately 1 mg/l of sodium chloride.

4 Dimensions

The dimensions of the preferred sizes are given in table.

Table

Dimensions in millimetres

Internal bowl diameter	35	55	75	100	150	200
Maximum external diameter at top of stem	9	11	13	17	22	30
Minimum internal diameter at bottom of stem	4	4	4	6	8	10

5 Construction

5.1 The filter funnel shall consist of a bowl having the shape of a frustum of a right circular cone, and a stem which shall be coaxial with the cone.

5.2 The inner wall of the bowl shall diverge from the axis so as to give an included angle of $60\,^{0}_{-3}$ degrees.

5.3 The bowl shall have a flanged rim for rigidity.

5.4 The bowl may be ribbed internally.

5.5 The bowl and stem shall be ribbed externally with at least three evenly spaced ribs.

5.6 The end of the stem shall be finished at approximately 45° to the axis.

5.7 The length of the stem shall be between 75 and 100 % of the bowl diameter for sizes up to 100 mm, and between 60 and 80 % for sizes above 100 mm.

5.8 The internal surface of the filter funnel shall have smooth contours with a stepless transition from bowl to stem.

5.9 The wall thickness and rim designs shall be such that, when tested for flexibility by the method specified in annex B, the diameter of the bowl at the point of loading shall not increase by more than 5 %.

6 Inscriptions

The following inscriptions shall be durably and legibly marked on all filter funnels :

a) the manufacturer's and/or vendor's name or readily identifiable mark;

b) the name of (or an appropriate symbol[1]) representing) the material from which the filter funnel is made, and the manufacturer's recommended safe maximum temperature for short term use (several hours) in contact with materials which do not attack the plastics material; for example, for polypropylene : PP 135 °C max;

NOTE — The temperature in the example is merely intended to indicate an inscription and does not represent any particular grade of plastics material.

c) the size, if required; the inscription shall refer to the internal cone diameter;

d) the number of this International Standard.

1) See ISO 1043, *Plastics — Symbols.*

Annex A

Determination of resistance to extraction of ionic material by water at 60 °C

A.1 Apparatus and materials

A.1.1 Stoppers, made of borosilicate glass, of sizes appropriate to the filter funnels under test.

A.1.2 Watch glasses and beakers, made of borosilicate glass, of sizes appropriate to the filter funnels under test.

A.1.3 Oven, capable of being controlled at 60 ± 2 °C.

A.1.4 Conductivity meter, suitable for measurement of the electrical conductivity of water.

A.1.5 De-ionized water, having a conductivity of less than 200 µS/m.

The conductivity at 20 °C shall be determined before use.

A.1.6 Detergent solution.

A.2 Procedure

Thoroughly clean each filter funnel with hot water and the detergent solution (A.1.6), then rinse well with hot water followed by cold water and finally with liberal quantities of de-ionized water (A.1.5). Insert a clean borosilicate stopper (A.1.1) into the stem of each funnel to seal the bottom end, and rinse the inside of each funnel again with liberal quantities of de-ionized water.

Suspend each funnel in a beaker (A.1.2) of suitable size, fill to within 1 cm of the brim with the de-ionized water and cover with a clean watch glass (A.1.2). Place each beaker in the oven (A.1.3) controlled at 60 ± 2 °C for 3 h.

Remove the beaker from the oven and allow the contents to cool to 20 °C. Measure the electrical conductivity of the water in the funnel and record the difference in conductivity, in microsiemens per metre, of the water before and after the test.

Annex B

Flexibility test

B.1 Apparatus

B.1.1 Weight, of 1 kg, attached by approximately 200 mm of strong thread to an S-hook made by bending iron or steel wire, of diameter 3 ± 1 mm, to a radius of curvature at the top bend of approximately 5 mm.

B.1.2 Soft rubber bung, to fit the lower end of the funnel stem.

B.1.3 Laboratory stand and **clamps.**

B.2 Procedure

Seal the lower end of the stem with the rubber bung (B.1.2). Assemble the stand and firmly clamp the funnel in a vertical position at a point approximately 1 mm below the junction of the stem and the cone.

For funnels having a tapered stem some packing may be required at the clamping point and, if necessary, a second clamp may be placed at the lower end of the stem.

Mark a point on the rim of the funnel cone and measure the external diameter of the cone in the plane of this point. Suspend the 1 kg weight (B.1.1), so that it hangs freely from the rim of the funnel, at the marked point. Fill the funnel to within 5 mm of the brim with water at 60 ± 2 °C.

One minute after filling, and whilst still under stress, again measure the external diameter of the cone in the plane of the marked point. Ignore any drop in temperature of the water during this period.

B.3 Expression of results

Calculate the percentage increase in diameter from the formula

$$\left(\frac{d_2}{d_1} - 1\right) \times 100$$

where

d_1 is the external diameter before the test;

d_2 is the external diameter after the test.

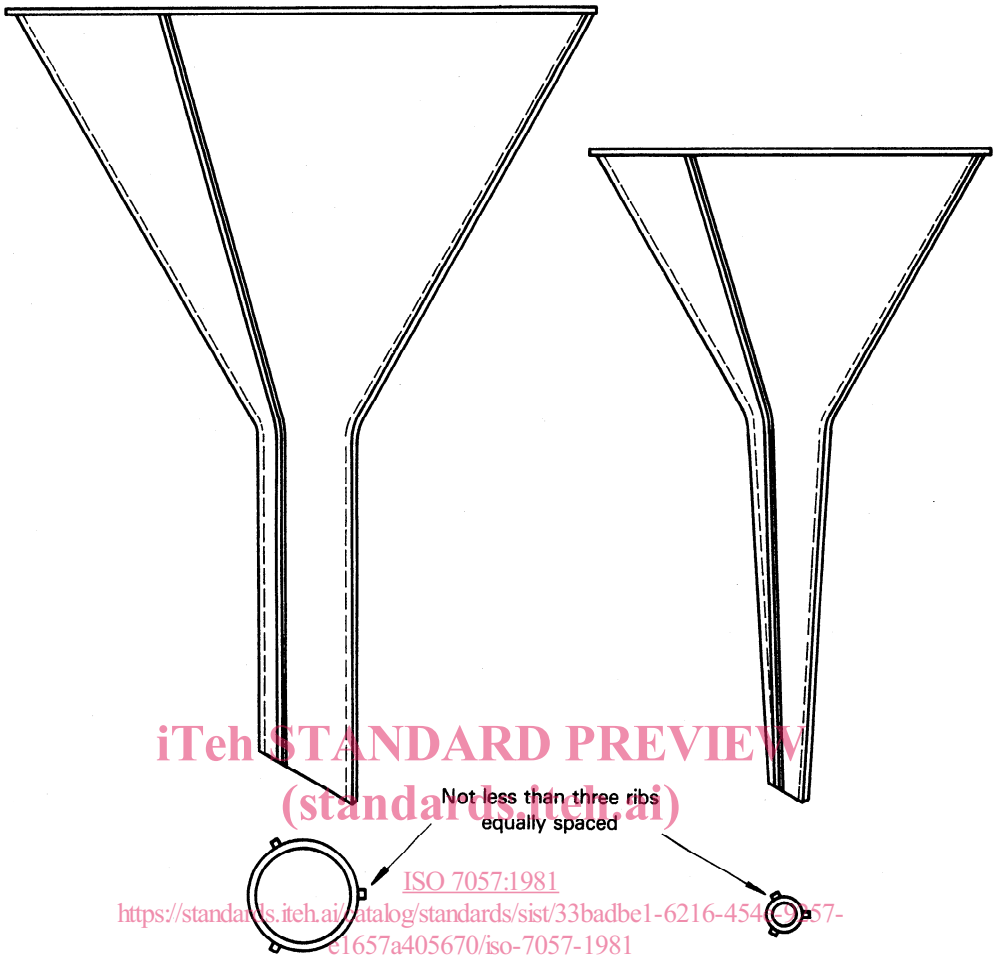

Figure — General designs of plastics filter funnels

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