INTERNATIONAL STANDARD 60

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

Plastics — Determination of apparent density of material that can be poured from a specified funnel

Plastiques — Détermination de la masse volumique apparente des matières susceptibles de s'écouler à travers un entonnoir donné

Second edition — 1977-08-01

UDC 678.033 : 531.755 **Ref. No. ISO 60-1977 (E)**

Descriptors : plastics, moulding materials, tests, physical tests, density measurement, bulk density.

Price based on 2 pages

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 60 was developed by Technical Committee ISO/TC 61, *Plastics.*

This second edition was submitted directly to the ISO Council, in accordance with clause 6.12.1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 60-1976), which had been approved by the member bodies of the following countries :

Australia	India	Portugal
Austria	Ireland	South Africa, Rep. of
Belgium	Israel	Spain
Chile	Italy	Sweden
Czechoslovakia	Japan	Turkey
Denmark	Mexico	United Kingdom
Finland	Netherlands	U.S.A.
France	New Zealand	U.S.S.R.
Germany	Pakistan	Yugoslavia
Greece	Poland	

No member body had expressed disapproval of the document.

Printed in Switzerland

Plastics — Determination of apparent density of material that can be poured from a specified funnel

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method of determining the apparent density, i.e. the mass per unit of volume, of loose material (powder or granular material) that can be poured from a funnel of specified design.

NOTE — For a method of determining the apparent density of loose moulding material that cannot be poured from a specified funnel, see ISO 61.

When the method is applied to relatively coarse materials, rather variable results may be obtained, owing to the error introduced when a straightedge blade is drawn across the top of the cylinder.

A knowledge of apparent density is of limited value in estimating the relative fluffiness or bulk of moulding materials, unless their densities in the moulded condition are approximately the same.

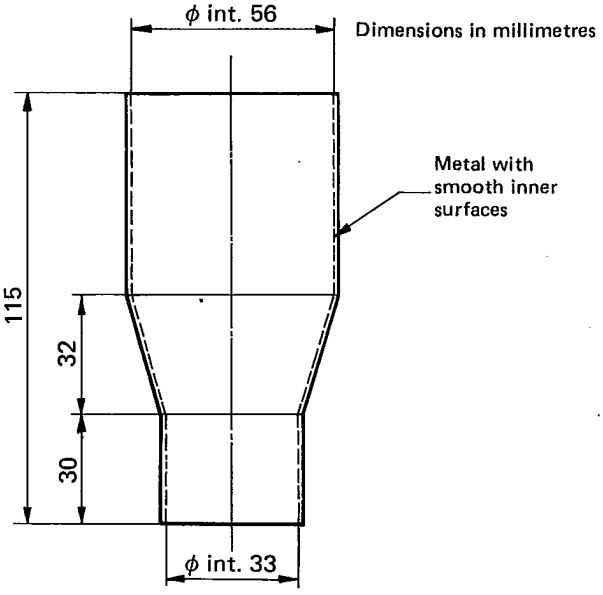

FIGURE — **Funnel**

2 APPARATUS

2.1 Balance, accurate to 0,1 g.

2.2 Measuring cylinder, smoothly finished inside, which may be constructed of metal, of capacity 100 ± 0,5 ml, and internal diameter 45 ± 5 mm.

2.3 Funnel, of the form and dimensions shown in the figure, with a cover for the lower orifice (for example metal plate).

3 PROCEDURE

3.1 Support the funnel (2.3) vertically with its lower orifice 20 to 30 mm above the measuring cylinder (2.2) and coaxial with it. Well mix the sample of the powder or granular material before test. With the lower orifice of the funnel closed by means of the cover, place a quantity of 110 to 120 ml of the powder or granular material in the funnel.

3.2 Remove the cover quickly and allow the material to flow into the measuring cylinder. If necessary, thermosetting moulding material may be assisted to flow by loosening the material with a rod. If the material will not flow owing to electrostatic charges, another test should be carried out with the addition of a small amount of gamma alumina[1] or carbon black (a few per cent) or ethanol (a few millilitres).

When the measuring cylinder is full, draw a straightedge blade across the top of the vessel to remove excess material. Weigh the contents of the measuring cylinder to the nearest 0,1 g, using the balance (2.1).

3.3 Make two determinations on the sample of moulding material under test.

4 EXPRESSION OF RESULTS

The apparent density of the material under test is given, in grams per millilitre, by the formula

$$\frac{m}{V}$$

where

m is the mass, in grams, of the contents of the measuring cylinder;

V is the volume, in millilitres, of the measuring cylinder (i.e. 100).

Take as the result the arithmetic mean of the results of the two determinations.

5 TEST REPORT

The test report shall include the following particulars :

a) complete identification of the material tested;

b) the individual results and the mean;

c) type and amount of antistatic agent added, if applicable.

1) For example, Degussa Aluminiumoxid P 110 C 1