91

INTERNATIONAL STANDARD 697

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

Washing powders — Determination of apparent density before and after compaction

Poudres à laver — Détermination de la masse volumique apparente avant et après tassement

First edition — 1975-12-15

UDC 661.185 : 542.3

Ref. No. ISO 697-1975 (E)

Descriptors : washing powders, tests, density measurement, bulk density.

Price based on 3 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 697 was drawn up by Technical Committee ISO/TC 91, *Surface active agents*. It was submitted directly to the ISO Council, in accordance with clause 6.12.1 of the Directives for the technical work of ISO.

This International Standard cancels and replaces ISO Recommendation R 697-1968, which had been approved by the Member Bodies of the following countries :

Austria	Hungary	Romania
Belgium	Ireland	South Africa, Rep. of
Brazil	Israel	Spain
Canada	Italy	Sweden
Chile	Japan	Switzerland
Czechoslovakia	Korea, Rep. of	Turkey
Egypt, Arab Rep. of	Netherlands	United Kingdom
France	New Zealand	U.S.S.R.
Germany	Poland	Yugoslavia
Greece	Portugal	

No Member Body had disapproved the Recommendation.

Printed in Switzerland

Washing powders — Determination of apparent density before and after compaction

0 INTRODUCTION

The density of a powder can be evaluated either by measuring the mass which occupies a given volume or by measuring the volume occupied by a given mass. In both cases, the procedure involves transfer of the powder from its original container to that used for the measurement. Because of the friability of the product, of its flow or caking properties, of the varying geometry of the particles of which it is composed and of the unavoidable compaction resulting from the fall, the apparent density determined will generally differ from that of the product in its original container or package.

The result of the determination will therefore only have a conventional value related to the test method used.

1 SCOPE

This International Standard specifies a method[1] for determining the density of washing powders, before and after compaction.

2 FIELD OF APPLICATION

In the case of powder containing lumps, the method is applicable only if these can be disintegrated readily without breaking down the particles of the powder.

3 REFERENCE

ISO 607, *Surface active agents — Methods of sample division.*[2]

4 DEFINITIONS[3]

4.1 apparent density of a powder before compaction : Mass (in grams) of unit volume (1 millilitre) of the powder after free fall.

4.2 apparent density of a powder after compaction : Mass (in grams) of unit volume (1 millilitre) of the powder after the container has been jolted until the sample has reached a constant volume.

5 PRINCIPLE

Measurement of the volume occupied by a given mass of the powder in a graduated measuring cylinder

- after free fall;
- after jolting the measuring cylinder until constant volume is obtained.

6 APPARATUS

(One form of apparatus is shown, as an example, in the figure.)

6.1 Measuring cylinder, capacity 250 ml, of glass or plastics, complying with ISO . . .[4]

It shall have the following characteristics :

- graduations at every 2 ml;
- maximum overall height 335 mm;
- minimum interior height to the top graduation 200 mm;
- diameter 42 mm;
- thickness 1,5 mm.

6.2 Funnel, to fit on the measuring cylinder.

7 SAMPLING

The laboratory sample of washing powder shall be prepared and stored according to the instructions given in ISO 607.

1) Another method, based on measurement of the mass of the powder filling a given volume under defined operating conditions, is in preparation.

2) In preparation. (Revision of ISO/R 607.)

3) The gram per millilitre (g/ml) is the unit of density of the CGS system.

The unit of density of the International System of Units (SI) is the kilogram per cubic metre (kg/m^3) : 1 $kg/m^3 = 10^{-3}$ g/ml.

4) In preparation.

8 PROCEDURE

8.1 Preparation of test sample

Break down any lumps present in the laboratory sample by shaking and rotating the container, taking care to avoid breaking down the particles of the powder.

Render the laboratory sample homogeneous and reduce its size by means of a conical divider as described in ISO 607.

8.2 Test portion

Take the test portion from the test sample (8.1). A test portion of 50 ± 0,1 g is recommended but, for very light powders, a smaller mass should be taken.

8.3 Determination

Carry out two determinations before compaction and two after compaction, on two different test portions, as follows :

8.3.1 *Determination before compaction*

Pour the test portion into the measuring cylinder through the funnel and level the surface of the powder without compressing it. Read the volume in the measuring cylinder.

8.3.2 *Determination after compaction*

Having filled the measuring cylinder as described in 8.3.1, allow it to fall from a height of 2,5 cm onto a wooden surface and repeat this operation until the volume no longer decreases. Read the final volume obtained.

NOTE – In the frequent case of washing powders containing a mixture of particles of different shape and density, the compaction also results in separation of these particles, so that the measured apparent density will not be that of the homogeneous powder.

9 EXPRESSION OF RESULTS

9.1 Method of calculation

The density of the powder before compaction, expressed in grams per millilitre, is given by the formula

$$\frac{m}{V_1}$$

The density of the powder after compaction, expressed in grams per millilitre, is given by the formula

$$\frac{m}{V_2}$$

where

m is the mass, in grams, of the test portion;

V_1 is the volume, in millilitres, of the powder after free fall (without compaction);

V_2 is the volume, in millilitres, of the powder after compaction.

In each case, take as the result the arithmetic mean of the duplicate determinations if the requirements of repeatability (see 9.2) are satisfied. If they are not, repeat the determination.

Express the results to two significant figures as follows :

"Apparent density before compaction, . . . g/ml"

"Apparent density after compaction, . . . g/ml"

9.2 Repeatability

The difference between the results of two determinations carried out simultaneously, or in rapid succession, by the same analyst, should not exceed 5 % of the mean value.

10 TEST REPORT

The test report shall include the following particulars :

a) all details required for complete identification of the sample;

b) whether or not lumps were present in the laboratory sample;

c) the reference of the method used;

d) the results and the method of expression used;

e) any unusual features noted during the determination;

f) any operation not included in this International Standard, or regarded as optional.

Dimensions in millimetres

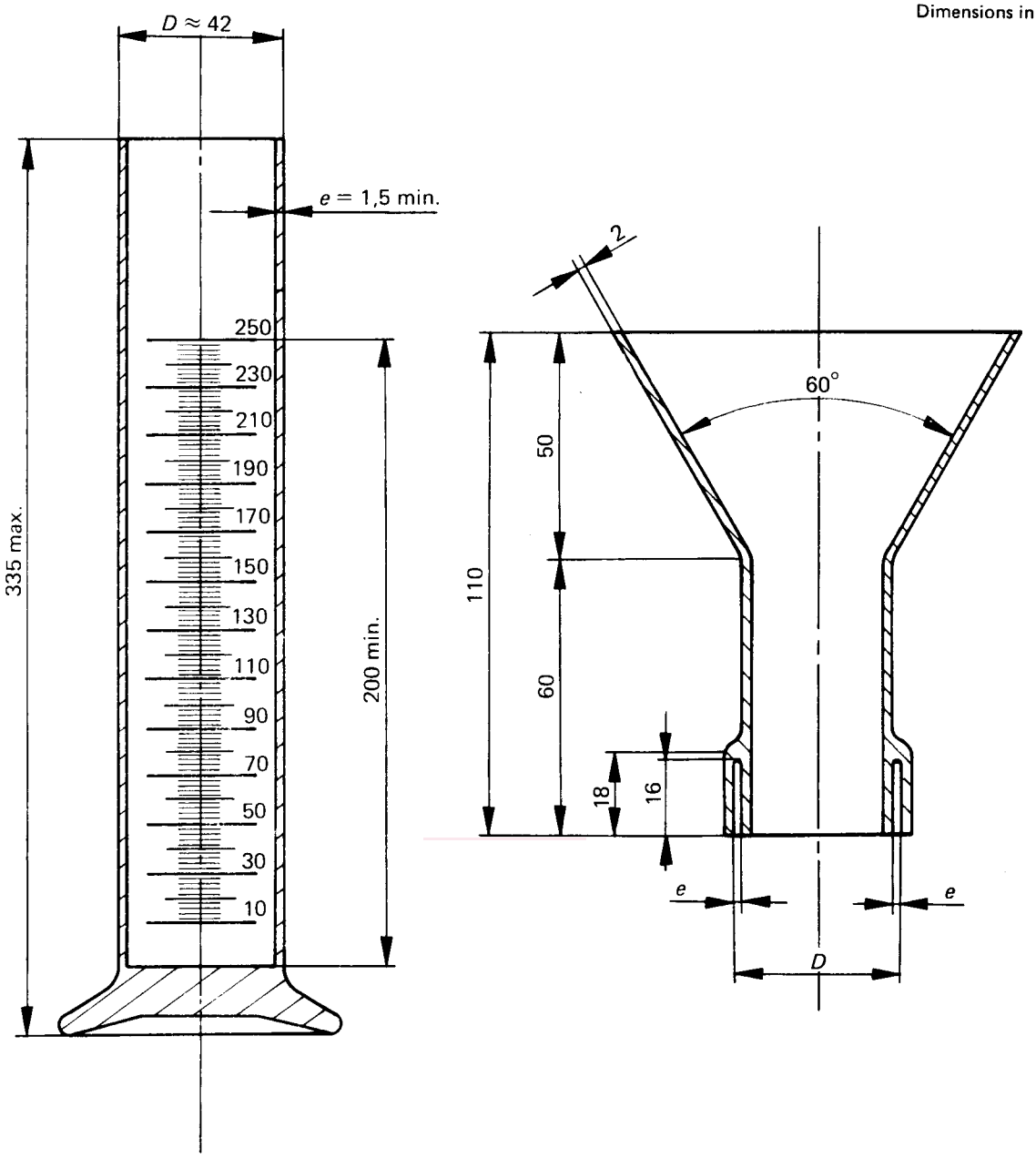

FIGURE — **Example of suitable apparatus**