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Sodium perborates for industrial use — Determination of bulk density

Perborates de sodium à usage industriel — Détermination de la masse volumique apparente

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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 3424 was drawn up by Technical Committee ISO/TC 47, *Chemistry,* and circulated to the Member Bodies in February 1974.

It has been approved by the Member Bodies of the following countries :

Austria	India	Spain
Belgium	Ireland	Switzerland
Bulgaria	Israel	Thailand
Chile	Netherlands	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
Finland	Poland	U.S.S.R.
France	Portugal	Yugoslavia
Germany	Romania	
Hungary	South Africa, Rep. of	

No Member Body expressed disapproval of the document.

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Sodium perborates for industrial use — Determination of bulk density

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the bulk density of sodium perborates for industrial use.

2 PRINCIPLE

Determination of the mass of product in a receiver of known dimensions, after running the sample out of a funnel of specified shape under specified conditions.

3 APPARATUS

The apparatus required is shown in the figure.

The essential parts are the funnel (A), the calibrated cylindrical receiver (B) and a closure plate (C) to cover the bottom of the funnel. The funnel may be constructed of any suitable material, for example stainless steel, plastics, wood, provided that the internal surface is smooth and polished and that all surfaces in contact with the material in flow are not conducive to the build-up of static electricity. The receiver is located centrally by an appropriate device, for example a stud or studs. The closure plate may be operated either manually or mechanically but, in either case, there shall be no impediment to free flow of the product. A straight edge, approximately 150 mm long, is also required.

4 PROCEDURE

4.1 Calibration of the receiver

Calibrate the receiver by establishing its volume in the following manner : Weigh the clean, empty receiver (B) and set it in a level position. Fill it with recently boiled distilled water at 20 °C, and remove any bubbles which collect during the filling by gently tapping the walls. Place a weighed sheet of plate glass, of approximate dimensions 100 mm × 100 mm × 7 mm, horizontally at the edge of the upper rim of the receiver. Gently slide the plate across the water surface and, when it is nearly across, add 1 to 2 ml of distilled water to the receiver and complete the movement of the plate. Dry the exposed underside of the plate and the sides of the receiver with filter paper and weigh with the glass in position.

The volume, in millilitres, of the receiver is given by the formula

$$m_2 - (m_0 + m_1)$$

where

m_0 is the mass, in grams, of the empty receiver;

m_1 is the mass, in grams, of the plate glass sheet;

m_2 is the mass, in grams, of the receiver full of water with the plate glass sheet in position.

It is convenient to adjust the volume of the receiver to 500 ± 0,5 ml by suitably machining the upper rim.

4.2 Determination

Place the funnel (A) on the stand. Place the tared receiver (B) in its working position. Cover the bottom opening of the funnel by means of the closure plate (C), holding the plate lightly against the funnel. Fill the funnel with the sample up to its upper lip, then quickly remove the closure plate, thus allowing the contents of the funnel to run into and overflow the receiver.

NOTE — If a sample should need to be divided, this should be carried out by a spinning cone device, which will ensure a representative sample, particularly with respect to particle size distribution.

An International Standard dealing with sampling from the consignment is in course of preparation.

Carefully level off the contents of the receiver and then tap it gently to compact the powder. Remove the receiver and clean outside with a dry cloth.

5 EXPRESSION OF RESULTS

Bulk density is given, in grams per millilitre, by the formula

$$\frac{m_1 - m_2}{V}$$

where

m_1 is the mass, in grams, of the receiver and its contents;

m_2 is the mass, in grams, of the receiver alone;

V is the volume, in millilitres, of the receiver.

6 TEST REPORT

The test report shall include the following particulars :

a) the reference of the method used;

b) the results and the method of expression used;

c) any unusual features noted during the determination;

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

Dimensions in millimetres

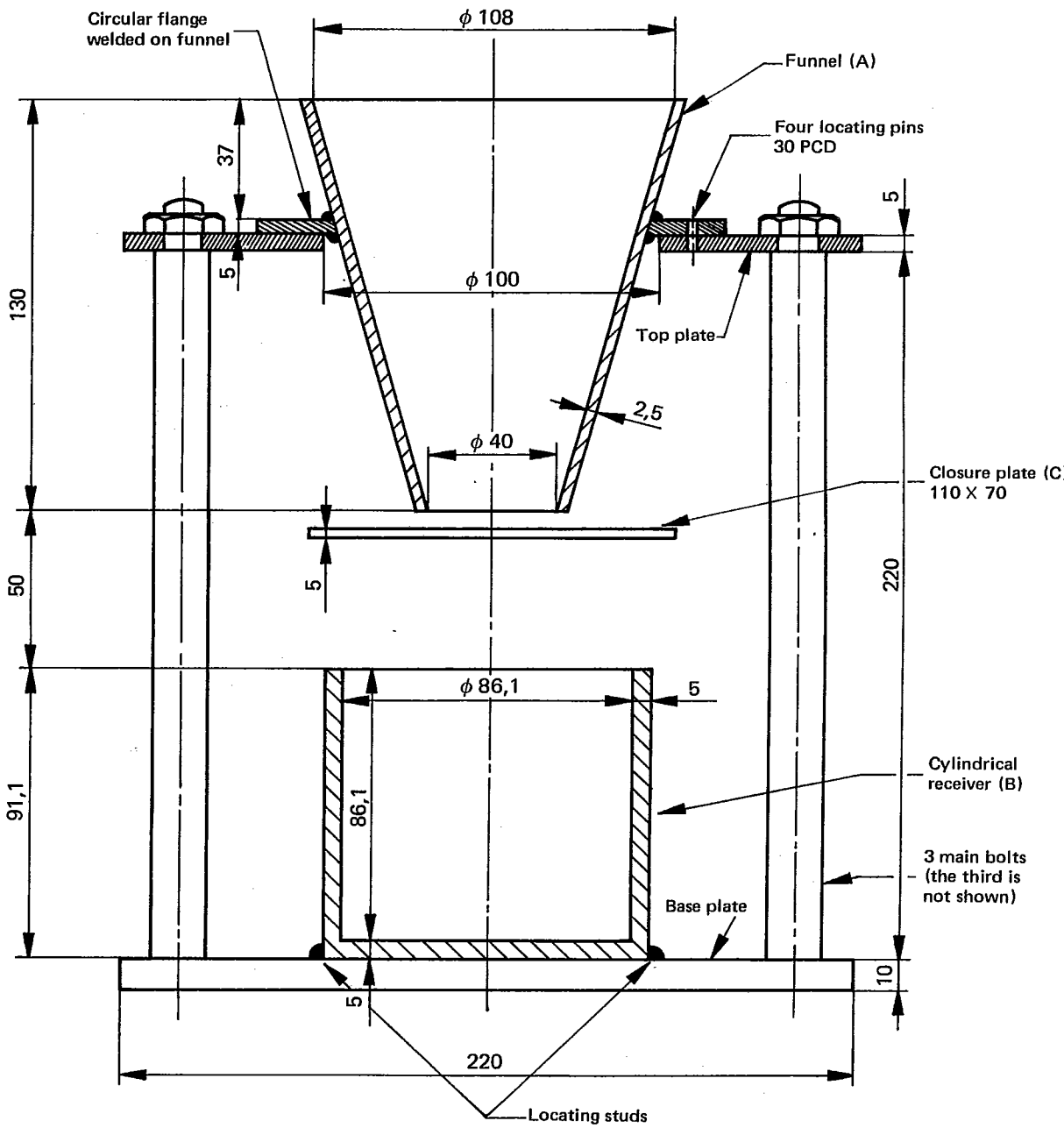

FIGURE — **Apparatus for determination of bulk density of sodium perborates**