BRITISH STANDARD

BS 4427-5: 1974

Methods of test for

Sodium tripolyphosphate (*penta*sodium triphosphate) and sodium pyrophosphate (*tetra*sodium pyrophosphate) for industrial use —

Part 5: Determination of particle size distribution

Confirmed December 2011

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Co-operating organizations

The Chemicals Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives of the following Government departments and scientific and industrial organizations:

British Steel Industry
Chemical Industries Association*
Department of Health and Social Security
Department of Trade and Industry-Chemicals and Textiles Division
Department of Trade and Industry-Laboratory of the Government Chemist*
Fertiliser Manufacturers' Association Limited*
Ministry of Agriculture, Fisheries and Food
National Sulphuric Acid Association
Royal Institute of Public Health and Hygiene
Soap and Detergent Industry Association

The Government department and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

British Pharmacopoeia Commission
Campden Food Preservation Research Association
Flour Milling and Baking Research Association
Institute of Metal Finishing
National Association of Soft Drink Manufacturers
Society for Water Treatment and Examination
Textile Institute

This British Standard, having been approved by the Chemicals Industry Standards Committee, was published under the authority of the Executive Board on 7 June 1974

The following BSI references relate to the work on this standard:
Committee reference CIC/25
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Amendments issued since publication

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Contents

Foreword

This British Standard has been prepared under the authority of the Chemicals Industry Standards Committee in order to provide methods for the analysis of sodium tripolyphosphate and sodium pyrophosphate.

For some years the United Kingdom has participated in the work of preparing methods of test applicable to sodium tripolyphosphate and sodium pyrophosphate for industrial use, organized by Subcommittee 6 (formerly Working Group 7), "Phosphoric Acid and Condensed Phosphates" of Technical Committee 47 "Chemistry" of the International Organization for Standardization (ISO). As international agreement is reached on the methods, it is proposed to publish them as Parts of this British Standard.

This Part is based on International Standard ISO 2996 "*Sodium tripolyphosphate and sodium pyrophosphate for industrial use — Particle size distribution by mechanical sieving*", modified to take into account the comments made by the United Kingdom during its development.

This standard specifies methods of test only and should not be used or quoted as a specification defining limits of purity. Reference to the standard should be in a form of words indicating that the methods of test used conform to the requirements of BS 4427.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 4427 specifies a mechanical sieving method for determination of the particle size distribution of *penta*sodium triphosphate and *tetra*sodium pyrophosphate for industrial use.

NOTE The title of the British Standard referred to in this Part is given on the inside back cover.

2 Principle

A test portion is mechanically sieved under fixed conditions and each of the fractions is weighed.

3 Apparatus

Ordinary laboratory apparatus and the following are required:

3.1 Series of *circular sieves*, complying with the requirements of BS 410, with metallic mountings, approximately 200 mm diameter, capable of being fitted tightly together and including a base and a cover.

The apertures shall be chosen, according to the characteristics of the product to be examined, from the following series:

mm
0.063
0.125
0.250
0.500
1.0
2.0
4.0

NOTE These apertures are specified in BS 410.

3.2 *Automatic device*[1)], capable of applying to a set of four sieves, complete with base and cover, a combination of movements in the horizontal plane and impacts along the vertical axis.

The movement in the horizontal plane is defined as follows (see Figure 1, in which the cross-hatched area indicates the plan of the sieve cascade). The centre of the sieves shall follow the same path as the mid-point C of a straight line AB of length 380 mm. One extremity A of this line describes a circle, of radius r = 20 mm, in a horizontal plane. The other extremity B is constrained to describe a straight line, of length $2r$ = 40 mm, lying on the line passing through the centre O of the circle.

The complete movement shall be repeated about 300 times per minute.

The vertical impacts are produced by a weight of about 1.2 kg falling from a height of 40 mm onto a rubber pad centrally located on a plate on the cover.

The frequency of impacts shall be about 150 impacts per minute and these shall not give rise to a vertical displacement of the sieves of greater than 0.5 mm.

3.3 *Oven*, capable of being controlled at 105 ± 2 °C.

4 Procedure

4.1 Test portion. Dry the laboratory sample in the oven (**3.3**), controlled at 105 ± 2 °C, for 1 h and allow to cool in a desiccator.

Weigh, to the nearest 0.01 g, 50 ± 0.02 g of the dried laboratory sample.

4.2 Determination. Choose from the series of sieves (**3.1**) four sieves which have apertures appropriate to the characteristics of the product to be examined.

Fit these four sieves, cleaned and dried, one within the other in the order of decreasing aperture size. Place the sieve with the smallest apertures at the bottom, on the base. Place the sieve with the largest apertures at the top.

Transfer quantitatively the test portion (**4.1**) to the topmost sieve and close the sieve with the cover.

Clamp the column of sieves on the shaking device (**3.2**) and connect to earth by a conductor.

Carry out the sieving for 30 min.

Weigh the contents of each sieve to the nearest 0.01 g.

Verify that the total of the masses obtained is equal, to the nearest 0.1 g, to the mass of the test portion. If it is not, repeat the determination with a fresh test portion.

5 Expression of results

Calculate for each sieve:

a) the mass (m), in grams, of product equal to the sum of the mass contained in that sieve and the masses contained in the sieves above;

b) the percentage of the test portion passing through each sieve, given by the expression: $100 - 2\,m$.

Express the results in the form of a table summarizing the percentages passing through the different sieves, commencing with the sieve with the largest aperture.

[1)] A device conforming to the specification is commercially available and information on suppliers may be obtained from the British Standards Institution, 2 Park Street, London W1A 2BS.

6 Test report

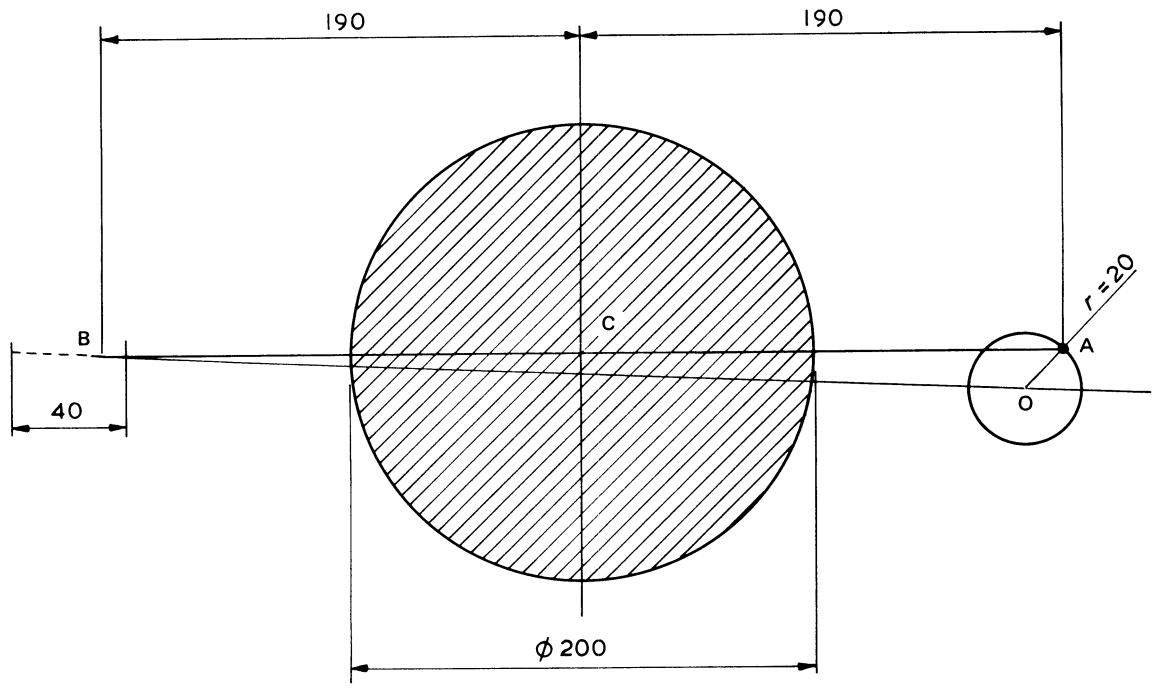
The test report shall include the following particulars:

a) the reference of the method used, i.e. BS 4427-5;

b) the results and the method of expression used;

c) any unusual features noted during the determination;

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



Dimensions in millimetres

Figure 1 — Diagram of movements in the horizontal plane

Publication referred to

This standard makes reference to the following British Standard:
BS 410, *Test sieves.*

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