BRITISH STANDARD

BS 3674:1981

Specification for

Sodium carbonate (technical grades)

Confirmed January 2011

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Cooperating organizations

The Chemicals Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following:

Association of Fatty Acid Distillers
British Tar Industry Association
Chemical Industries Association*
Chemical Society, Analytical Division
Consumer Standards Advisory Committee of BSI
Department of Health and Social Security
Department of Industry (Laboratory of the Government Chemist)
Fertiliser Manufacturers' Association Ltd.
Ministry of Agriculture, Fisheries and Food
Ministry of Defence*
National Sulphuric Acid Association
Paintmakers' Association of Great Britain Ltd.
Royal Institute of Public Health and Hygiene
Soap and Detergent Industry Association*
Standardization of Tar Products Tests Committee

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the Technical Committee entrusted with the preparation of this British Standard:

British Man-made Fibres Association
British Textile Employers' Association
Fabric Care Research Association
Society of Glass Technology

This British Standard, having been prepared under the direction of the Chemicals Standards Committee, was published under the authority of the Board of BSI and comes into effect on
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The following BSI references relate to the work on this standard:
Committee reference CIC/22
Draft for comment 80/53293 DC

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Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

Foreword

This British Standard, prepared under the direction of the Chemicals Standards Committee, revises the 1963 edition, which is therefore withdrawn.

Two specifications for sodium carbonate are given. One covers the hydrated product for use as a general household and industrial detergent, for which purposes it has the advantage over anhydrous sodium carbonate in that it dissolves easily in cold water; the other covers the anhydrous material which has a wide range of industrial applications, particularly in glass making and in the heavy chemicals industry.

The standard has been revised in the light of current requirements and differs from the original publication in the following respects.

a) The test methods are not appended to this revision but are published as Parts of BS 6070. In preparing BS 6070 the opportunity has been taken to implement those test methods prepared by Technical Committee 47, Chemistry, of the International Organization for Standardization (ISO) which have been prepared as a result of international collaboration in which the United Kingdom has participated.

b) The units for the specification values have been altered, where necessary, to conform with the expression of results in the associated revised test methods.

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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 British Standard specifies requirements for sodium carbonate decahydrate and anhydrous sodium carbonate of technical quality suitable for general industrial purposes.

This standard does not apply to sodium carbonate for medical or pharmaceutical use or to a grade for photographic use.

NOTE These grades are covered by the British Pharmacopoeia and BS 3305 respectively.

2 References

The titles of the publications referred to in this standard are listed on the inside back cover.

3 Description

3.1 Sodium carbonate decahydrate. The material shall consist essentially of sodium carbonate decahydrate, $Na_2CO_3 \cdot 10H_2O$. It shall be in the form of almost colourless crystals which effloresce in dry air and shall be free from visible impurities.

3.2 Anhydrous sodium carbonate. The material shall consist essentially of anhydrous sodium carbonate, Na_2CO_3. It shall be in the form of white powder or granules and shall be free from visible impurities.

NOTE The density of commercially available material may vary, e.g. the material known in the trade as "light ash" corresponds to a pouring density of about 0.5 g/ml whereas that known as "heavy ash" corresponds to one of about 1.0 g/ml.

4 Sampling and size of sample

Sampling shall be in accordance with BS 6070-0. A sample size of 500 g is required for the purpose of examination in accordance with this specification. In the case of the anhydrous material, a total sample of 2 kg is required if it is necessary to determine the pouring density.

5 Material requirements

The material shall comply with the appropriate requirements of Table 1. Testing for compliance shall be carried out using the methods specified therein, with modifications, as shown in the right-hand column of the table.

6 Packaging and marking

The material shall be supplied in sound, clean and dry containers. Identification and marking shall be in accordance with current legislation.

Table 1 — Material requirements

Property	Sodium carbonate decahydrate	Anhydrous sodium carbonate	Test method BS 6070: Part	Particular requirements in carrying out the determination
Total soluble alkali content as Na_2CO_3 % by mass, min.	35.9[a]	97.9[b] 99.2[c]	1 1	
Matter insoluble in water % by mass, max.	0.2	0.02	4	
Sulphate content as SO_4 mg/kg, max.	2 000	300	5	Use the following test portion: 1. *Decahydrate.* Prepare a 4 % (*m*/*m*) solution and take a 5.0 ml aliquot portion of this solution for the determination. 2. *Anhydrous material.* About 1.5 g of the test sample, weighed to the nearest 0.01 g
Chloride content as NaCl % by mass, max.	0.30	0.70	2	1. Use a test portion equivalent to 15 g of the anhydrous material, weighed to the nearest 0.1 g. 2. In **6.2.1** of Part 2:1980 add 15 ml (*not* 30 ml) of the nitric acid solution (**4.1**) to effect near-neutralization of the test solution
Iron content as Fe mg/kg, max.	70	35	—	Test method to be agreed by purchaser and supplier pending publication and implementation as a British Standard, of the ISO general method (1,10-phenanthroline) for determination of iron content
Copper content, as Cu mg/kg, max.	Not specified	4	7	
Pouring density g/ml	Not specified	Subject to agreement between purchaser and supplier	6	

[a] Sodium carbonate decahydrate (soda crystals) tends to lose moisture by efflorescence of the crystals. This may result in the material as delivered or as used having a higher sodium carbonate content than at the time of manufacture.

[b] This requirement is for the anhydrous materials at the time of packing. Material containing lower than 97.9 % of Na_2CO_3 at the time of delivery shall, however, be deemed to comply with the requirements of this standard provided that the difference from 97.9 % is due solely to the uptake of moisture and carbon dioxide. This requirement is satisfied if the Na_2CO_3 content of the material delivered, multiplied by the mass of material delivered and divided by the mass of material invoiced, is not lower than 97.9 %. Alternatively, if required by the purchaser, the material shall, at the time of delivery, contain not lower than 94.0 % of Na_2CO_3.

[c] This determination is carried out on material that has been heated for 1 h in an electrically-heated oven or an electrically-heated muffle furnace controlled at 250 °C to 300 °C.

Publications referred to

BS 3305, *Specification for photographic grade sodium carbonate, anhydrous.*
BS 6070, *Methods of sampling and test for sodium carbonate for industrial use.*
BS 6070-0, *General introduction.*
BS 6070-1, *Determination of total soluble alkali content.*
BS 6070-2, *Determination of chloride content.*
BS 6070-4, *Determination of matter insoluble in water.*
BS 6070-5, *Determination of sulphate content.*
BS 6070-6, *Determination of pouring density.*
BS 6070-7, *Determination of copper content.*

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