BRITISH STANDARD

BS 4130:1984

Incorporating Amendment No. 1

Specification for

Sodium hydroxide (technical grades)

Confirmed January 2011

UDC 661.322.1

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Chemicals Standards Committee (CIC/-) to Technical Committee CIC/22 upon which the following bodies were represented:

Chemical Industries Association
Fabric Care Research Association
Man-made Fibres Producers' Committee
Ministry of Defence
Soap and Detergent Industry 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
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Amendments issued since publication

Amd. No.	Date of issue	Comments
7671	April 1993	Indicated by a sideline in the margin

Contents

Foreword

This revision of this British Standard, which has been prepared under the direction of the Chemicals Standards Committee, supersedes BS 4130:1967, which is withdrawn. This standard contains requirements for technical grades of sodium hydroxide in aqueous solution and solid form, to meet the needs of government departments and other users. It designates two types of material corresponding to the two main manufacturing processes. Type 1 is usually manufactured in mercury cathode electrolytic brine cells; type 3 is manufactured in diaphragm electrolytic brine cells.

Type 1 material is of high purity and is largely used for rayon manufacture. Type 3 material is suitable for the majority of general purposes.

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

a) The requirements for material made by the lime soda process, designated type 2, which is no longer of commercial significance in the UK, have been omitted.

b) An additional form of solid material, designated “pearl”, has been included in the description.

c) The test methods are not appended to this revision but are published as Parts of BS 6075. In preparing BS 6075 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 UK experts have actively participated.

d) Units have been altered where necessary to conform with the expression of results in the associated revised test methods.

To help purchasers ordering to this standard, Appendix A summarizes the information required by the supplier.

WARNING. Sodium hydroxide causes severe burns. Avoid contact with skin and eyes.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, 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 material requirements for technical grades of sodium hydroxide in aqueous solution and solid form for general industrial purposes, including packaging requirements.

It does not apply to sodium hydroxide for medical or pharmaceutical use, which is covered by the British Pharmacopoeia, or sodium hydroxide for photographic use, requirements for which are specified in BS 3308.

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

2 Description

2.1 Solution. The material shall consist essentially of an aqueous solution of sodium hydroxide (NaOH). It shall be virtually clear and colourless and shall be free from visible impurities.

2.2 Solid. The material shall consist essentially of sodium hydroxide (NaOH).

NOTE 1 Its form, e.g. solid, flakes, powder, stick, pearls or pellets, should be a matter for agreement between purchaser and supplier.

NOTE 2 Fused material that has been allowed to solidify in the drum in which it is supplied is generally described in the trade as "solid".

3 Sampling and size of sample

The material shall be sampled in accordance with clauses **2** and **3** of BS 6075-5:1981. The sample size shall be not less than 500 mL for solutions or 500 g for solid materials.

4 Classification

Sodium hydroxide in aqueous solution or solid form shall be classified as follows.

a) *Type 1:* usually manufactured in mercury cathode electrolytic brine cells.

NOTE Type 1 (97.5 %) solid form, containing not less than 97.5 % by mass of sodium hydroxide, is also specified (see **5.3**).

b) *Type 3:* manufactured in diaphragm electrolytic brine cells.

NOTE Type 3 (unfiltered) solution is also specified (see **5.4**).

5 Material requirements

5.1 Type 1 and type 3 solid form. These materials shall comply with the relevant requirements of Table 1, except that the requirement for maximum iron content shall not apply to fused material solidified in the drum. Testing for compliance with these requirements shall be by the methods given in Table 1, modified if necessary as indicated in column 7.

5.2 Type 1 and type 3 solutions. Type 1 and type 3 solutions of concentration 46.0 % by mass of sodium hydroxide shall comply with the relevant requirements of Table 1. For solutions of other concentrations (see Table 2), the limits for chloride, sulphate, iron, copper and silica shall be in the same proportion to the limits given in Table 1 as are the sodium hydroxide contents to 46.0 %, except that the sulphate limit of all type 1 solutions, irrespective of concentration, shall be 20 mg/kg. Testing for compliance with these requirements shall be by the methods given in Table 1, modified if necessary as indicated in column 7.

5.3 Type 1 (97.5 %) solid form. This material shall comply with the relevant requirements of Table 1, with the following exceptions.

a) It shall contain not less than 97.5 % by mass of sodium hydroxide (NaOH).

b) The carbonate content, calculated as carbon dioxide (CO_2), shall not exceed 1.04 % by mass.

c) The requirement for maximum iron content shall not apply to fused material solidified in the drum.

Testing for compliance with these requirements shall be by the methods given in Table 1, modified if necessary as indicated in column 7.

NOTE This material is usually supplied by agreement between purchaser and supplier.

5.4 Type 3 (unfiltered) solution. This solution, which has not been filtered, shall comply with the requirements of Table 1 except that it shall contain no more than 2.0 % by mass of chloride, calculated as sodium chloride (NaCl). Testing for compliance with these requirements shall be by the methods given in Table 1, modified if necessary as indicated in column 7.

NOTE This material is usually supplied by agreement between purchaser and supplier.

6 Packaging

The sodium hydroxide shall be supplied in sound, clean, and, in the case of the solid material, dry containers.

The container shall be capable of being resealed so as to avoid absorption of carbon dioxide and moisture from the atmosphere.

NOTE Identification and marking of the container should be in accordance with the purchasing contract and relevant legislation. Attention is drawn to Classification, Packaging and Lebelling of Dangerous Substances Regulations, SI 1984 No. 1244 and amendments thereof, which are currently in force.

Table 1 — Material requirements and methods of test

1	2	3	4	5	6	7
Property	**Solution**		**Solid form**		**Method of test (Part of BS 6075)**	**Notes on use of method of test**
	Type 1	**Type 3**	**Type 1**	**Type 3**		
Approximate solution density g/mL at 20 °C °Tw (degrees Twaddell)	1.5 100	1.5 100	— —	— —	— —	
Minimum sodium hydroxide content as NaOH % by mass	46.0	46.0	99.0[a]	95.0	1	BS 6075-5 and BS 6075-6 are also required in conjunction with Part 1 to carry out this determination
Maximum matter insoluble in water % by mass	Not specified	Not specified	0.05	0.05	14	
Maximum carbonate content as CO_2 % by mass	Not specified	Not specified	0.21[a]	0.83	6	Use test portions weighed to the nearest 0.01 g as follows: type 1: 10 g type 1 (97.5 %) solid form (see **5.3**): 3 g type 3: 5 g
Maximum chloride content as Cl mg/kg	60	—	120	—	7	Use a test portion of mass corresponding to approx. 5 g of NaOH, weighed to the nearest 0.01 g
as NaCl % by mass	—	1.1[b]	—	2.5	2	Use a test portion of mass corresponding to approx. 4 g of NaOH, weighed to the nearest 0.01 g In **6.2.1**, line 2, add 6 mL (*not* 30 mL) of the nitric acid solution (**4.1**)
Maximum sulphate content as SO_4 mg/kg	20	200	350	350	8	Use test portions weighed to the nearest 0.01 g as follows: type 1 solution: 5 g type 3 solution, types 1 and 3 solid form: 1 g
Maximum iron content as Fe[c] mg/kg	5	15	40	40	3	For types 1 and 3 solid form, use a test portion of mass approx. 15 g, weighed to the nearest 0.01 g
Maximum copper content as Cu mg/kg	0.5	1.0	2.0	2.0	12	
Maximum silica content as SiO_2 mg/kg	20	Not specified	40	Not specified	4	In preparing the standard colorimetric solutions (**6.3.1**), use the following volumes of the standard silica solution (**4.9**) instead of those given in the table.

Standard silica solution (4.9)	**Corresponding mass of SiO_2**
mL	mg
0	0
0.5	0.005
1.0	0.010
1.5	0.015
2.0	0.020

[a] See **5.3**

[b] See **5.4**

[c] Not applicable to fused material which has been solidified in the drum (see **5.1** and **5.3**)

Table 2 — Solutions of concentrations other than 46.0 %

Minimum sodium hydroxide (NaOH) content	Density at 20 °C	
% by mass	g/mL	°Tw
31.0	1.35	70
35.5	1.40	80
40.5	1.45	90
46.5	1.51	102
48.5	1.53	106

Appendix A Information to be provided to the supplier

A.1 General

When ordering sodium hydroxide complying with this standard, the information listed in **A.2** and **A.3** should be given to the supplier.

A.2 Solutions

a) The type of solution required, i.e. type 1, type 3 or type 3 (unfiltered).

b) The strength of the solution, preferably as minimum sodium hydroxide content or, alternatively, in terms of degrees Twaddell.

c) Packaging and marking details.

A.3 Solid form

a) The type required, i.e. type 1, type 3 or type 1 (97.5 %).

b) The form required, i.e. solid, flakes, powder, stick, pearls or pellets.

c) Packaging and marking details.

Publications referred to

BS 3308, *Specification for photographic grade sodium hydroxide.*
BS 6075, *Methods of sampling and test for sodium hydroxide for industrial use.*
BS 6075-1, *Determination of sodium hydroxide content.*
BS 6075-2, *Determination of chloride content (mercurimetric method).*
BS 6075-3, *Determination of iron content.*
BS 6075-4, *Determination of silica content.*
BS 6075-5, *Sampling and preparation of main test solution.*
BS 6075-6, *Determination of carbonate content.*
BS 6075-7, *Determination of chloride content (photometric method).*
BS 6075-8, *Determination of sulphate content.*
BS 6075-12, *Determination of copper content.*
BS 6075-14, *Determination of matter insoluble in water.*

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