

Specification for

Hydrochloric acid commercial Types 1 and 2

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- Board of Trade
- British Iron and Steel Federation
- Chemical Industries Association*
- Fertilizer Manufacturers' Association
- Gas Council*
- Institute of Vitreous Enamellers
- Institution of Gas Engineers
- Ministry of Defence, Army Department*
- Ministry of Health
- National Sulphuric Acid Association*
- Royal Institute of Public Health & Hygiene

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:

- Royal Institute of Chemistry

This British Standard, having been approved by the Chemicals Industry Standards Committee and endorsed by the Chairman of the Chemical Divisional Council, was published under the authority of the General Council on 7 March 1966

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The following BSI references relate to the work on this standard:
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Amendments issued since publication

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Foreword

This standard makes reference to the following British Standards:

BS 506, *Methanol*.

BS 612, *Nessler cylinders*.

BS 846, *Burettes and bulb burettes*.

BS 976, *Density composition tables for aqueous solutions of hydrochloric acid*.

BS 1647, *pH scale*.

BS 1752, *Laboratory sintered or fritted filters*.

BS 1792, *One-mark volumetric flasks*.

BS 3218, *Test tubes and boiling tubes*.

BS 3591, *Industrial methylated spirits*.

The preparation of this British Standard was authorized by the Chemicals Industry Standards Committee in order to provide specifications for hydrochloric acid.

The importance of the impurities that may be present in hydrochloric acid depends to some extent on the use to which the material is to be put. This standard specifies those impurities that are commonly of importance to users who may, however, wish to supplement them with requirements in respect of such matters as extraneous odour and organic impurities.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16 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 two types of hydrochloric acid.

2 Description

The material shall consist essentially of an aqueous solution of hydrogen chloride, HCl. It shall be clear, ranging in colour from colourless to pale yellow.

3 Requirements

The material shall comply with the requirements as shown in the following table when tested by the appropriate method given in Column 4:

	Type 1	Type 2	Method of test in Appendix
Relative density ^a at 20/20 °C	1.137 to 1.142 or 1.157 to 1.162 or 1.177 to 1.182		—
Residue on evaporation: per cent by weight, maximum	0.1	^b	A
Sulphated residue on ignition: per cent by weight, maximum	0.05	0.2	B
Total sulphate (as H ₂ SO ₄): per cent by weight, maximum	0.05		C
		0.6	D
Iron: parts per million by weight, maximum	5	50	E
Arsenic: parts per million by weight, maximum	1	2	F
Lead: parts per million by weight, maximum	1	2	G
Copper: parts per million by weight, maximum	1	2	H
Mercury: parts per million by weight, maximum	5	^b	J
Oxidizing substances (as Cl ₂): parts per million by weight, maximum	50	100	K
Reducing substances (as SO ₂): parts per million by weight, maximum	50	100	K
NOTE The HCl content of a sample of Type 1 acid may be obtained by reference to BS 976, "Density composition tables for aqueous solutions of hydrochloric acid". Because of the dissolved solids it may contain, the HCl content of a sample of Type 2 acid may be obtained only approximately in this way. ^a Formerly "specific gravity": "relative density" is the term adopted for this concept, with water as the reference substance, by the International Organization for Standardization (ISO). ^b Not specified.			

4 Sampling and size of sample

For the purpose of examination in accordance with this specification a representative sample of the material measuring not less than 2 litres shall be taken from the bulk. The sample shall be placed in a clean dry air-tight glass-stoppered bottle of such a size that it is nearly filled by the sample. When it is necessary to seal the container, care shall be taken to avoid the risk of contaminating the contents in any way.

5 Packaging and marking

The material shall be supplied in suitable sound, clean, moisture-resistant containers which shall be marked to indicate clearly the full identity of the contents. The marking shall include the number of this British Standard, viz. BS 3993, Type 1, or BS 3993, Type 2.

NOTE The mark BS 3993 on or in relation to the product is a claim by the manufacturer that it complies with the requirements of the standard.

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Appendix A Method for the determination of residue on evaporation

A.1 Apparatus

Platinum dish, approx. 2 in (50 mm) diameter.

A.2 Procedure

Transfer 100 ml of the sample in successive small portions to the weighed platinum dish and evaporate to dryness on a boiling-water bath in a fume cupboard. Dry the dish and residue for 30 minutes in an oven at a temperature of 105 ± 1 °C. Cool in a desiccator and weigh immediately.

A.3 Calculation

Residue on evaporation, per cent by weight

$$= \frac{W_1}{d}$$

where d = relative density, of the sample at room temperature

and W_1 = weight, in grammes, of residue found.

Appendix B Method for the determination of sulphated residue on ignition

B.1 Apparatus

Platinum dish, approx. 2 in (50 mm) diameter.

B.2 Reagent

The reagent used shall be of a recognized analytical reagent quality.

Sulphuric acid, concentrated, $d = 1.84$.

B.3 Procedure

Transfer 250 ml (for Type 1 acid) or 50 ml (for Type 2 acid) of the sample in successive small portions to the weighed platinum dish and evaporate to dryness on a boiling-water bath in a fume cupboard. Cool and cover the residue with a few drops of concentrated sulphuric acid. Heat the dish on a sand-bath or hot plate until no further fumes are evolved and finally ignite to constant weight at 850 ± 50 °C.

B.4 Calculation

Sulphated residue on ignition, per cent by weight

$$= \frac{W_2 \times 100}{d \times V_1}$$

where d = relative density of the sample at room temperature,

V_1 = volume, in millilitres, of sample taken

and W_2 = weight, in grammes, of residue found.

Appendix C Method for the determination of total sulphate content

(For Type 1 acid only)

C.1 Outline of method

The sulphate present is determined nephelometrically using a standard solution of sulphuric acid for reference purposes.

C.2 Apparatus

- a) *Microburette*, 5 ml complying with BS 846¹⁾.
- b) *Two similar test tubes*, 125 × 16 mm, complying with BS 3218²⁾.

¹⁾ BS 846, "Burettes and bulb burettes".

²⁾ BS 3218, "Test tubes and boiling tubes".