

Care and maintenance of underwater breathing apparatus —

Part 1: Recommendations for the compressed air open circuit type

Cooperating organizations

The Personal Safety Equipment Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations.

British Footwear Manufacturers' Federation	Industrial Safety (Protective Equipment)
British Rubber Manufacturers' Association*	Manufacturers' Association*
British Safety Council	Institute of British Foundrymen
British Steel Industry	Institution of Civil Engineers
Cement Makers' Federation	Institution of Industrial Safety Officers
Chemical Industries Association	Institution of Production Engineers
Council of Ironfoundry Associations	Iron and Steel Trades Confederation
Department of industry, National Engineering Laboratory	Light Metal Traders Organization
Electricity Supply Industry in England and Wales	Medical Research Council
Engineering Employers' Federation	Ministry of Agriculture, Fisheries and Food
Engineering Equipment Users' Association	National Coal Board
Federation of Civil Engineering Contractors	National Joint Council for the Building Industry (Operatives Side)
Glass Manufacturers' Federation	National Radiological Protection Board
Health and Safety Executive*	Royal Society for the Prevention of Accidents
	Trades Union Congress

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 the British Standard:

Aluminium Federation	British Sub-Aqua Club
Association of British Oceanological Industries Ltd.	Department of Energy, Safety and Health Division
Association of Offshore Diving Contractors	Department of the Environment (PSA)
Association of Underwater Contractors	Department of Trade (Marine Division)
British Association of Breathing Apparatus Service Engineers	Royal Society for the Prevention of Accidents
British Compressed Gases Association	Underwater Equipment and Apparel Manufacturers Association
British Ports Association	

This British Standard, having been prepared under the direction of the Personal Safety Equipment Standards Committee, was published under the authority of the Executive Board and comes into effect on 30 April 1981

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First published March 1966
First revision April 1981

The following BSI references relate to the work on this standard:
Committee reference PST/27
Draft for comment 79/64398 DC

ISBN 0 580 11898 3

Amendments issued since publication

Amd. No.	Date of issue	Comments

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Foreword

This Part of this British Standard was prepared under the direction of the Personal Safety Equipment Standards Committee. It was originally published at the request of the Home Office, and has now been revised to update it in the light of experience. It gives guidance for the care and maintenance of both cylinders and equipment to ensure that maximum safety and efficiency are obtained from the apparatus.

BS 4001 is published in two Parts:

Part 1: "Recommendations for the compressed air open circuit type". This is equipment in which compressed air carried in cylinders is fed through a demand valve and breathing tube to a mouthpiece. Exhaled air passes through a non-return valve to the atmosphere;

Part 2: "Recommendations for standard diving equipment".

Attention is drawn to statutory requirements for diving operations.

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 8, 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 this British Standard gives recommendations for the care and maintenance of compressed air open circuit underwater breathing apparatus of the self-contained type. Items covered are cylinders, cylinder valves, demand regulators, pressure reducing valves and manifolds, pressure gauges, flexible hoses and rubber, fabric and plastics components.

Recommendations on the preparation and identification of cylinders, the compression of air, decant filling, and the purity of the breathing air are given in Appendix A.

2 References

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

3 General

Strict attention to the care and maintenance of all types of breathing apparatus used underwater is of vital importance at all times. More damage is probably caused to underwater apparatus by mishandling out of water, by incorrect maintenance and during storage, than is incurred during actual diving operations. It is essential that the complete equipment be thoroughly examined for damage or defect before and after every occasion on which it is used. All defects should be rectified before the equipment is used again.

The recommendations made in the following sections concerning the handling of the various components should be most carefully observed and the maker's instructions with regard to assembly, adjustment, replacement of components and maintenance should be obtained and followed.

It should be borne in mind that the lightweight construction of self-contained breathing apparatus renders it vulnerable to damage through mistreatment. Careless manipulation with inappropriate tools may not only give rise to dangerous defects, but render further maintenance expensive or impossible.

The corrosive action of seawater and water-borne contaminants should never be underestimated, and if precautions are not taken to clean the apparatus properly after use, serious damage may be caused to all parts of the apparatus while it is stowed away. It is worth remembering that, even when diving in apparently fresh water, there may be corrosive substances in solution such as chemical and petroleum wastes which are not noticeable at the time, but which will start corrosive action if left in contact with the apparatus.

4 Cylinders

4.1 Use of proper cylinder. In the United Kingdom, cylinders having a water capacity of approximately 5.4 litres¹⁾ (12 lb) or more to contain compressed air are subject to the statutory Gas Cylinders (Conveyance) Regulations SR and 0,1931 No. 679 (as amended 1947 and 1959) and various Exemption Orders issued under these Regulations. The use of cylinders manufactured in accordance with the following specifications is permitted for underwater use:

²⁾Home Office Specification "S" for Seamless alloy steel cylinders for the conveyance of compressed gases

²⁾Home Office Specification "T" for Seamless alloy steel cylinders for the conveyance of compressed gases

Air Ministry Specification 0.133. As covered by Exemption Order no. 41 of the Gas Cylinder (Conveyance) Regulations SR and 0.679-1931. (Wire wound cylinders covered by Specification 0.133 are not recommended for underwater use and in no circumstances should the wire be removed.)

Home Office Specification HOAL. 1: for Seamless aluminium alloy cylinders for the conveyance of compressed gases

²⁾Home Office Specification HOAL. 2: for Seamless aluminium alloy cylinders for the conveyance of compressed gases

²⁾Home Office Specification HOAL. 3: for Seamless aluminium alloy cylinders for the conveyance of compressed gases

²⁾Home Office Specification HOAL. 4: for Seamless aluminium alloy cylinders for the conveyance of compressed gases

²⁾BS 5045 — *Transportable gas containers* — Part 1 *Seamless steel containers* — Part 3³⁾ *Seamless aluminium alloy containers*.

¹⁾ The figure is approximate because 12 lb is defined in legislation.

²⁾ These specification are for cylinders currently being produced.