



BSI Standards Publication

Respiratory protective devices for use against chemical, biological, radiological and nuclear (CBRN) agents –

Part 6.2: Constant flow compressed airline
equipment – Specification

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This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 14, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard was published by BSI and came into effect on 31 January 2011. It was prepared by Technical Committee PH/4, *Respiratory protection*. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

BS 8468 will be issued in nine parts:

- *Part 1: Positive pressure, self-contained breathing apparatus – Specification;*
- *Part 2: Negative pressure air purifying devices with full face mask – Specification;*
- *Part 3.1: Self-contained open-circuit compressed air breathing apparatus incorporating a hood for escape – Specification;*
- *Part 3.2: Air-purifying devices incorporating a hood for escape – Specification;*
- *Part 4: Powered air-purifying respirators – Specification;*
- *Part 5: Dual-mode apparatus – Specification;*
- *Part 6.1: Positive-pressure compressed airline equipment – Specification;*
- *Part 6.2: Constant flow compressed airline equipment – Specification;*
- *Part 7: Closed-circuit breathing apparatus – Specification.*

NOTE This standard may be used in conjunction with BS 8467, which gives categorization, requirements and test methods for personal protective ensembles against CBRN agents.

Information about this document

Increased threat to civilians, emergency and support agencies from chemical, biological, radiological and nuclear (CBRN) agents has led to a need for suitable personal protective equipment (PPE). The lack of coverage of combined CBRN protection in existing British Standards on PPE has recently been identified. This standard has been prepared to give requirements for such PPE.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This British Standard specifies requirements for compressed air line breathing apparatus with constant airflow as a respiratory protective device intended to be used during rescue, evacuation, escape, hazard containment and decontamination, and similar activities by emergency first responders (e.g. fire, ambulance, police, and associated civilian agencies and workers) in areas containing and contaminated by chemical, biological, radiological and nuclear (CBRN) agents.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 132, *Respiratory protective devices – Definitions of terms and pictograms*

BS EN 134, *Respiratory protective devices – Nomenclature of components*

BS EN 136:1998, *Respiratory protective devices – Full face masks – Requirements, testing, marking*

BS EN 137:2006, *Respiratory protective devices – Self-contained open-circuit compressed air breathing apparatus with full face mask – Requirements, testing, marking*

BS EN 1073-1, *Protective clothing against radioactive contamination – Part 1: Requirements and test methods for ventilated protective clothing against particulate radioactive contamination*

BS EN 12021, *Respiratory protective devices – Compressed air for breathing apparatus*

BS EN 13274-1, *Respiratory protective devices – Methods of test – Part 1: Determination of inward leakage and total inward leakage*

BS EN 14594:2005, *Respiratory protective devices – Continuous flow compressed air line breathing apparatus – Requirements, testing marking*

BS EN 14593-1:2005, *Respiratory protective devices – Compressed air line breathing apparatus with demand valve – Part 1: Apparatus with a full mask – Requirements, testing, marking*

3 Terms and definitions

For the purpose of this British Standard the terms and definitions defined in BS EN 132, BS EN 134 and BS EN 14594:2005 apply.

4 Description

Compressed air line breathing apparatus with constant flow for use with a full face mask, hood, helmet or suit (the apparatus), which enables the wearer to be provided with breathable air conforming to BS EN 12021, which continuously flows through a flow control valve (if fitted) to a suitable facepiece or suit, possibly via a breathing hose or medium-pressure supply tube(s). A compressed air supply tube

connects the wearer to a supply of compressed air. The excess and exhaled air flows into the ambient atmosphere.

5 Requirements

5.1 General

The apparatus shall be constant flow equipment conforming to either of the following.

- 1) BS EN 14594:2005, class 4A or class 4B; or BS EN 14594:2005, class 4A or class 4B and the lower inward leakage specified in 5.2 of this standard. If the facepiece is a full facemask, it shall conform to BS EN 136:1998 class 2 or class 3.

OR

- 2) BS EN 1073-1.

The apparatus shall also conform to the chemical agent permeation and penetration resistance specified in 5.3 of this standard.

5.2 Lower inward leakage

Where a lower inward leakage is claimed, the maximum inward leakage shall be < 0.01% when tested as a complete system in accordance with BS EN 13274-1:2001 8.4c).

NOTE This requirement is more stringent than the one given in BS EN 14594:2005. Detection systems should take account of the increased sensitivity required.

5.3 Chemical agent permeation and penetration

For apparatus that can be tested on SMARTMAN (see A.4.4), the apparatus shall be resistant to chemical agents up to the maximum levels given in Table 1 when tested in accordance with Annex A.

Where the apparatus cannot be tested on SMARTMAN (see A.4.4), the highest cumulative permeation for the exposed materials of the apparatus, including the compressed-air supply tube (CAST), for each chemical over 4 h shall not exceed $1.25 \mu\text{g}/\text{cm}^2$, when tested against all of the liquid test chemicals listed in BS 8467:2006, Annex D. (The liquid concentration density of each chemical is $10 \text{ g}/\text{m}^3$, applied as nominal 1 μL drops, drops applied uniformly over the sample surface. Where a seam closure or fixture is included, at least three drops are applied at each critical juncture, such as the seam edge. The test cell is assembled in the open configuration.)

NOTE Where components are made of materials identical (in composition and minimum thickness) to those used previously and have been shown to meet the requirements as part of other devices that conform to this standard then this information may be used to demonstrate compliance in this instance.

For each type of apparatus tested on SMARTMAN, six devices shall be tested, two devices (one for each agent) in as-received condition and four devices (two for each agent) conditioned in accordance with BS EN 14594:2005 or BS EN 1073-1, as appropriate.