BS ISO 17420-7:2021

BSI Standards Publication

Respiratory protective devices — Performance requirements

Part 7: Special application marine, mining, welding, and abrasive blasting — Filtering RPD and supplied breathable gas RPD

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National foreword

This British Standard is the UK implementation of ISO 17420-7:2021.

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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

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Respiratory protective devices — Performance requirements —

Part 7: Special application marine, mining, welding, and abrasive blasting - Filtering RPD and supplied breathable gas RPD

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Partie 7: Applications particulières pour environnements marins, exploitation minière, soudage et projection d'abrasifs - APR alimentés en gaz respirables et APR filtrants

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 15, *Respiratory protective devices*.

A list of all parts in the ISO 17420 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document describes requirements for RPD used for special application other than fire services and escape and its elements and components.

Some test methods are described. For other test methods references are given to the ISO 16900 series standards of "Methods of test and test equipment" or other test methods not developed by ISO/TC 94/SC 15.

The sequence of testing follows the principle to minimize the necessary number of samples by carrying out destructive tests at the end. It also includes for safety reason that tests with test subjects are only carried out after the test samples have shown their safe performance in other tests.

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Respiratory protective devices — Performance requirements —

Part 7:
Special application marine, mining, welding, and abrasive blasting - Filtering RPD and supplied breathable gas RPD

1 Scope

This document specifies the requirements for supplied breathable gas respiratory protective device (RPD) and filtering RPD to be used for special application marine, mining, welding and abrasive blasting for use in the workplace to protect the wearer.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 8031, *Rubber and plastics hoses and hose assemblies - Determination of electrical resistance and conductivity*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 13506-1, *Protective clothing against heat and flame — Part 1: Test method for complete garments — Measurement of transferred energy using an instrumented manikin*

ISO 16900-1:2019, *Respiratory protective devices — Methods of test and test equipment — Part 1: Determination of inward leakage*

ISO 16900-2, *Respiratory protective devices — Methods of test and test equipment — Part 2: Determination of breathing resistance*

ISO 16900-5, *Respiratory protective devices — Methods of test and test equipment — Part 5: Breathing machine, metabolic simulator, RPD headforms and torso, tools and verification tools*

ISO 16900-6, *Respiratory protective devices — Methods of test and test equipment — Part 6: Mechanical resistance/strength of components and connections*

ISO 16900-7, *Respiratory protective devices — Methods of test and test equipment — Part 7: Practical performance test methods*

ISO 16900-10, *Respiratory protective devices — Methods of test and test equipment — Part 10: Resistance to ignition, flame, radiant heat and heat*

ISO 16900-12, *Respiratory protective devices — Methods of test and test equipment — Part 12: Determination of volume-averaged work of breathing and peak respiratory pressures*

ISO 16900-14, *Respiratory protective devices — Methods of test and test equipment — Part 14: Measurement of sound level*

ISO 16972, *Respiratory protective devices — Terms, definitions, graphical symbols and units of measurement*

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ISO/TS 16975-1:2016, *Respiratory protective devices — Selection, use and maintenance — Part 1: Establishing and implementing a respiratory protective device programme*

ISO 17420-1:2021, *Respiratory protective devices — Performance requirements — Part 1: General*

ISO 17420-2:2021, *Respiratory protective devices — Performance requirements — Part 2: Requirements for filtering RPD*

ISO 17420-4:2021, *Respiratory protective devices — Performance requirements — Part 4: Requirements for supplied breathable gas RPD*

ISO 23269-2:2011, *Ships and marine technology. Breathing apparatus for ships. Self-contained breathing apparatus for shipboard firefighters*

IEC 60068-2-27:2010, *Environmental testing — Part 2-27: Tests — Test Ea and guidance: Shock*

IEC 60068-2-64:2009, *Environmental testing — Part 2-64: Tests — Test Fh: Vibration, broadband random and guidance*

IEC 60079-0, *Explosive atmospheres — Part 0: Equipment — General requirements*

IEC 60079-11, *Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i"*

IEC 60079-32-1:2013, *Explosive atmospheres — Part 32-1: Electrostatics hazards — Guidance*

IEC 60079-32-2:2015, *Explosive atmospheres — Part 32-2: Electrostatics hazards — Tests*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60721-1:1990, *Classification of environmental conditions — Part 1: Environmental parameters and their severities*

IEC 60721-3-2:2018, *Classification of environmental conditions — Part 3-2: Classification of groups of environmental parameters and their severities — Transportation and Handling*

IEC 61000-6-2, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity standard for industrial environments*

ISO 6529:2013, *Protective clothing — Protection against chemicals — Determination of resistance of protective clothing materials to permeation by liquids and gases*

EN 50303, *Group 1, category M1 equipment intended to remain functional in atmospheres endangered by firedamp and/or coal dust*

ASTM D1003:2013, *Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics*

ASTM D6413, *Standard Test Method for Flame Resistance of Textiles (Vertical Test)*

NFPA 1981:2013, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16972 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

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3.1
non pre-conditioned state
without pre-conditioning but possibly modified to carry out tests or already used in non-destructive tests

Note 1 to entry: This includes e.g. cleaning and disinfection.

3.2
RPD in as worn state
RPD where all components are connected and assembled in the way that it is intended to be used (e.g. to the wearer, RPD headform or RPD headform and torso or suitable holder)

Note 1 to entry: All of the various components [e.g. for an assisted filtering device: blower unit, battery, Respiratory Interface (RI), filters, etc.] have been completely assembled and then connected (RI connected to the hose of the blower unit) together in accordance with the information supplied by the manufacturer.

3.3
component in ready for assembly state
component with seals, plugs, packaging or other environmental protective means still in place

3.4
RPD in ready for use state
RPD ready to be donned as described by the manufacturer

Note 1 to entry: In line with the information supplied by the manufacturer for donning the RPD, further actions can be necessary.

Note 2 to entry: For escape devices this includes also the RPD in its carrying container unopened.

3.5
permeation
process by which a chemical moves through a given material on a molecular level

4 Classification overview

ISO 17420-2:2021, Clause 4 or ISO 17420-4:2021, Clause 4 applies.

4.1 General

ISO 17420-1:2021, 4.1 applies.

The following subclauses apply in addition to ISO 17420-2:2021, Clause 4:

4.2 Supplied breathable gas RPD

In addition, supplied breathable gas RPD may be classified for one or more special applications, as given in Table 1.

Table 1 — Special application classification supplied breathable gas RPD

Special application	Classes
Marine	MA2 (Marine firefighting) MA1 (Hazardous material)
Mining	MN3 (Mining firefighting and Rescue) MN2 (Underground mining explosive) MN1 (Underground mining non-explosive)
Abrasive blasting	AB
Welding	WE

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Example for a special application supplied breathable gas RPD with protection class (PC5), work rate class (W3), RI class (cT), supplied breathable gas capacity class (S1800) and special application mining firefighting and rescue class (MN3)

Marking for the given example PC5 W3 cT S1800 MN3

4.3 Filtering RPD

In addition, filtering RPD may be classified for one or more special applications, as given in Table 2.

Table 2 — Special application classification of filtering RPD

Special application	Classes
Mining	MN2 (Underground mining explosive) MN1 (Underground mining non-explosive)
Abrasive blasting	AB
Welding	WE

Example for a special application filtering RPD with Protection class (PC3), work rate class (W2), RI class (bT), particle filter performance class (F3) and special application underground mining non-explosive class (MN1).

Marking for the given example PC3 W2 bT F3 MN1

Multi-functional filtering RPD have separate classifications for each function, i.e. one classification for the unassisted mode and one classification for the assisted mode.

5 General requirements for RPD

ISO 17420-1:2021, Clause 5 and ISO 17420-2:2021, Clause 5 or ISO 17420-1:2021, Clause 5 and ISO 17420-4:2021, Clause 5 apply.

6 Basic requirements for supplied breathable gas RPD or filtering RPD

All requirements of ISO 17420-2:2021, Clause 6 or ISO 17420-4:2021, Clause 6 apply unless superseded by this document and indicated in the relevant clauses.

7 Special application for supplied breathable gas RPD for marine, mining, welding, abrasive blasting and filtering RPD formining, welding, abrasive blasting

7.1 Special application – Requirement matrices

7.1.1 General

Supplied breathable gas RPD for marine, mining, welding, abrasive blasting shall each fulfil the requirements listed in their respective requirements Table 3 to Table 6.

Filtering RPD for mining, welding, abrasive blasting shall each fulfil the requirements listed in their respective requirements Table 7 to Table 9.

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