DRAFT INTERNATIONAL STANDARD

ISO/DIS 17420-6

ISO/TC **94**/SC **15** Secretariat: **DIN**

Voting begins on:
2020-03-20

Voting terminates on:
2020-06-12

Respiratory protective devices — Performance requirements —

Part 6:
Special application escape — Supplied breathable gas RPD and filtering RPD

ICS: 13.340.30

Member bodies are requested to consult relevant national interests in ISO/TC 94/SC 14 before casting their ballot to the e-Balloting application.

This document is circulated as received from the committee secretariat.

Reference number
ISO/DIS 17420-6:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 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.

Introduction

This document describes requirements for RPD including its elements and components used for special applications for escape devices.

Some test methods are described. For other test methods references are given to the ISO 16900 series "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.

Respiratory protective devices — Performance requirements —

Part 6: Special application escape — Supplied breathable gas RPD and filtering RPD

1 Scope

This document specifies the requirements for supplied breathable gas RPD and for filtering RPD to be used for special application escape for use in the workplace to protect the wearer.

2 Normative references

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

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 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 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 16900-1:2014, *Respiratory protective devices — Methods of test and test equipment — Part 1: Determination of inward leakage*

ISO 16900-4, *Respiratory protective devices — Methods of test and test equipment — Part 4: Determination of gas filter capacity and migration, desorption and carbon monoxide dynamic testing*

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 16900-8, *Respiratory protective devices — Methods of test and test equipment — Part 8: Measurement of RPD air flow rates of assisted filtering RPD*

ISO 16900-9, *Respiratory protective devices — Methods of test and test equipment — Part 9: Determination of carbon dioxide content of the inhaled gas*

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

ISO 17420-1:202x, *Respiratory protective devices — Performance requirements — Part 1: General*

ISO 17420-2:202x, *Respiratory protective devices — Performance requirements — Part 2: Requirements for filtering RPD*

ISO 17420-4:202x, *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 — Part 2: Self-contained breathing apparatus for shipboard firefighters*

ASTM E11, *Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves*

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

3 Terms, definitions, abbreviations and symbols

3.1 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:

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

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

3.1.1
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.

3.1.2
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. worn by the wearer, adapted to an RPD headform or RPD headform and torso or suitable holder) IT012

Note 1 to entry: All of the various components (e.g. for an assisted filtering RPD: blower unit, battery, 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.

3.1.3
component in ready for assembly state
component with seals, plugs, packaging or other environmental protective means, still in place

3.1.4
RPD in ready for assembly state
RPD with seals, plug, or other environmental protective means, still in place

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

3.1.5
RPD in ready for use state
RPD ready to be donned as described by the manufacturer, but seals, plug, or other environmental protective means are already removed

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.

3.1.6
standardized connector
filter connector meeting the requirements of ISO 17420-3

3.2 Abbreviated terms

RI	Respiratory Interface
RPD	Respiratory Protective Devices
V_T	Tidal volume
WoB	Work of Breathing

3.3 Symbols

3.3.1

Crossed out 2: “For single shift use only”

4 Classification overview

ISO 17420-2:202x, Clause 4 or ISO 17420-4:202x, Clause 4 applies.

4.1 General

ISO 17420-1:202x, 4.1 applies.

The following subclause applies in addition to ISO 17420-2:202x, Clause 4:

4.2 Supplied breathable gas RPD for escape

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
Escape	ES MN t[a] (Underground mining escape) ES MA t[a] (Marine escape) ES FF t[a] (Escape from fire) ES t[a] (Escape general supplied breathable gas)
[a] nominal service life in t min, e.g. ES 15	

Example for a special application escape with Protection class (PC4), RI class (dL) and special application class (ES 15).

EXAMPLE PC4 dL ES 15

The following subclause applies in addition to ISO 17420-2:202x, Clause 4.

4.3 Filtering RPD for escape

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
Escape	ES MN t[a] (Underground Mining Escape) ES FF t[a] (Escape from fire) ES XX[b] t[a] (Escape general filtering)
[a] nominal service life in "t" min b Gas type	

Example for a special application escape general with Protection class (PC3), RI class (bT) and special application escape (ES), particle filter performance class (F3) and gas filter class (AC) and class t (10).

EXAMPLE PC3 bT ES F3 AC10

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 17420-1:202x, Clause 5 and ISO 17420-2:202x, Clause 5 or ISO 17420-4:202x, Clause 5 applies.

6 Basic requirements for supplied breathable gas RPD and filtering RPD

All requirements of ISO 17420-2:202x, Clause 6 or ISO 17420-4:202x, Clause 6 applies unless superseded by this document and indicated in the relevant clauses.

NOTE 1 Optional features are also given in ISO 17420-2 or ISO 17420-4.

NOTE 2 Where requirements are superseded by those in Clause 7 of this document test schedules given in ISO 17420-2:202x, Annex C or ISO 17420-4:202x, Annex C can be used as a guideline.

7 Special application for supplied breathable gas escape RPD and filtering escape RPD

7.1 Special application escape RPD - Requirement matrices

7.1.1 General

Supplied breathable gas escape RPD shall fulfil all requirements given in Table 3

Filtering escape RPD shall fulfil all requirements given in Table 4.

7.1.2 Supplied breathable gas RPD — Escape

Table 3 gives an overview about requirements and preconditioning of special application supplied breathable gas RPD — Escape.

At least one RPD shall be tested after each required preconditioning. Pre-conditionings shall not be combined.

Table 3 shall be read as follows:

In the first column the requirements are given. In the third to sixth column the required pre-conditioning for different escape classes are given.

For each pre-conditioning within one line of the cell different sample(s) shall be used.

EXAMPLE For the requirement 7.1.9.3 and class marine escape the following applies:

At least one sample shall be preconditioned TH&VSS&IE (Exposure to temperature and humidity, exposure to vibration and shock – marine and intermittend exposure) At least one further sample shall be preconditioned DR (Exposure to impact from drop) At least one further sample shall be preconditioned DU (Exposure to dust)

For the total number of samples see ISO 17420-1:202x, 5.1.

Table 3 — Special application requirement overview — Supplied breathable gas RPD — Escape

Requirement	Title	Supplied breathable gas escape general ES (t [a])	Escape from fire ES FF (t [a])	Marine escape ES MA (t [a])	Underground mining escape ES MN (t [a])
		Protection class ≥ PC3	Protection class ≥ PC3	Protection class ≥ PC3	Protection class ≥ PC3
		Pre-conditioning			
7.2.2.1[b]	Contact with hot and cold surfaces – Supplied breathable gas escape RPD	TH&VS&IE	TH&VSF&IE	TH&VSS&IE	TH&VSM&PR&IE
7.2.3	Avoidance of frictional sparks	AR/NP	AR/NP	AR/NP	AR/NP
7.2.4.1	Six burner dynamic	—[c]	AR	AR	AR
7.2.6.2	Intrinsic Safety – Firefighting	—	AR/NP	—	—
7.2.6.3	Intrinsic Safety – Mining	—	—	—	AR/NP
7.2.6.4	Intrinsic Safety – Marine	—	—	AR/NP	—
7.2.7.1	Antistatic properties - General	—	AR/NP	AR/NP	AR/NP
7.2.7.2	Antistatic properties – Fire-fighting	—	AR/NP	—	—