SLOVENSKI STANDARD
oSIST prEN 13794:2025

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Oprema za varovanje dihal - Samoreševalni avtonomni dihalni aparat z zaprtim krogom - Zahteve, preskušanje in označevanje

Respiratory protective devices - Self-contained closed-circuit breathing apparatus for escape - Requirements, testing and marking

Atemschutzgeräte - Isoliergeräte für Selbstrettung - Anforderungen, Prüfung, Kennzeichnung

Appareils de protection respiratoire - Appareils isolants autonomes à circuit fermé pour l'évacuation - Exigences, essais, marquage

Ta slovenski standard je istoveten z: **prEN 13794**

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13.340.30	Varovalne dihalne naprave	Respiratory protective devices

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EUROPEAN STANDARD

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Will supersede EN 13794:2002

English Version

Respiratory protective devices - Self-contained closed-circuit breathing apparatus for escape - Requirements, testing and marking

Appareils de protection respiratoire - Appareils isolants autonomes à circuit fermé pour l'évacuation - Exigences, essais, marquage

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This draft European Standard is submitted to CEN members for second enquiry. It has been drawn up by the Technical Committee CEN/TC 79.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Page

European foreword

This document (prEN 13794:2024) has been prepared by Technical Committee CEN/TC 79 “Respiratory protective devices”, the secretariat of which is held by DIN.

This document is currently submitted to the 2nd CEN Enquiry.

This document will supersede EN 13794:2002.

EN 13794:2024 includes the following significant technical changes with respect to EN 13794:2002:

— Scope more specified;

— Clause 2 updated;

— Clause 3 modified and additional terms added;

— the description updated and CO_2 absorption capability included in Clause 4;

— duration-classification-increment clearer defined in Clause 5;

— distinction for mobile (M) and immobile (cache units or non carried-units) (R) and devices used for underground (S) added to 5.1;

— references to the test clauses updated in Clause 6;

— FMEA as tool to verify obligations of the manufacturer in the design phase added to 6.1;

— restriction for dust migration into the respiratory interface (RI) and requirement for units equipped with a quick start system and information for training units added to 6.2;

— former Clause 6.3 is now 6.4, with adopting verification of corrosion for the intended use added in 6.4.1, more detailed requirement for use in explosive atmosphere added to 6.4.2, skin compatibility now in 6.4.3, oxygen compatibility and pureness of the oxygen now defined in 6.4.4;

— in 6.9 leaktightness in different use conditions more specified;

— in 6.10, the respiratory interface (RI) is clearly defined instead of the facepiece to cover different design types;

— in 6.11, for goggles, the dust protection instead of leak tightness is required, if a google and not a full face masks is the reference to the RI;

— in 6.12, the test of proper function of inhalation and exhalation valves at practical performance only, is added;

— relief valve spec in 6.13 specified after environmental exposure;

— requirements for the breathing bag deleted (remark: rational, if the performance is given, the bag can have any size that’s suitable, for KO2 or NaClO3 units a bigger bag usually has positive impact);

— 6.15 covers mechanical stress (in three different directions), resistance to temperature and drop test, which is now from 1,0 m instead of 1,5 m;

— additional vibration test at predefined frequences for man carrying units added.

— laboratory performance tests specified more clearly in 6.17;

— Machine settings, added (See Tables 1 and 2;

— clearer specifications at the different work durations at 10 L/min and 35 L/min;

— new temperature limits specified for different conditions of inhaled gas and tests at the extremes in the environmental test chambers defined;

— a new Table 3 (test schedule) for Type M and R devices added;

— Annex A and B revised.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

1 Scope

This document specifies minimum requirements for self-contained closed-circuit breathing RPD for escape (short: oxygen escape RPD)

a) chemical oxygen type

— potassium superoxide (KO_2),

— sodium chlorate ($NaClO_3$) and

b) compressed oxygen type.

This document does not apply to RPD for work and rescue and to diving apparatus.

Laboratory and practical performance tests are included for the assessment of compliance with the requirements.

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.

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

EN 13274-1:2001, *Respiratory protective devices - Methods of test - Part 1: Determination of inward leakage and total inward leakage*

EN 13274-2:2019, *Respiratory protective devices - Methods of test - Part 2: Practical performance tests*

EN 13274-3:2002, *Respiratory protective devices - Methods of test - Part 3: Determination of breathing resistance*

EN 13274-4:2020, *Respiratory protective devices - Methods of test - Part 4: Flame test*

EN 13274-5:2001, *Respiratory protective devices - Methods of test - Part 5: Climatic conditions*

EN ISO 16321-1:2021, *Eye and face protection for occupational use - Part 1: General requirements*

EN ISO 18526-3:2021, *Eye and face protection - Test methods - Part 3: Physical and mechanical properties*

EN ISO 80079-36:2016

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in EN ISO 16972, EN 134 and the following apply.

3.1
quick start system
mechanism which activates the generation or flow of breathable gas whilst opening the container or by pulling the facepiece

3.2
ready for use configuration
complete respiratory protective device, which may not be fully assembled, but is in a state which allows the immediate start of the donning procedure as described by the manufacturer

4 Description

An oxygen escape RPD is designed and constructed so that exhaled breathing gas is ducted from the facepiece into a circuit which contains a cartridge and a breathing bag where it is available for re-breathing. The cartridge contains chemicals which absorb exhaled carbon dioxide and - in case of a KO_2 RPD - humidity and also generates oxygen.

In case of a $NaClO_3$ RPD, a chemical oxygen source ($NaClO_3$ candle) generates the oxygen to be needed.

In case of a compressed oxygen RPD, oxygen is fed into the circuit at a suitable point by means of a constant flow device or by a lung governed demand valve or by a suitable combination of both.

The breathing gas flow may be of the pendulum or loop type and excess gas is ejected to the surrounded atmosphere via a relief valve.

5 Classification

5.1 General

Oxygen escape RPD are classified according to their oxygen source and rated working duration in types and classes.

RPD intended to be carried on a person, machine or vehicle shall be classified as “M”, otherwise it shall be classified as “R”.

5.2 Types of oxygen escape RPD

— Type C $NaClO_3$ RPD;

— Type D Compressed oxygen RPD;

— Type K KO_2 RPD.

5.3 Classes of oxygen escape RPD

Oxygen escape RPD classes are defined by rated working duration with increments of 5 min up to and including duration of 30 min and thereafter in steps of 10 min.

The minimum class has a rated working duration of 5 min and is class 5.

The classes are assessed by the requirements of 6.18.2.1.

6 Requirements

6.1 General

All test samples specified in the related test clauses shall meet the relevant requirements.

Where it is required in a specific clause, the manufacturer shall declare that a risk assessment e.g. a Failure Modes and Effect Analysis (FMEA) concerning these specific requirements has been conducted.

NOTE Further information is given in EN 60812 [1].

6.2 Nominal values and tolerances

Temperature limits, values which are not stated as maxima or minima shall be subject to a tolerance of ± 5 %. Unless otherwise specified, the ambient conditions for testing shall be between 16°C and 32°C and (50 ± 30) % relative humidity.

6.3 Any temperature limits specified shall be subject to an accuracy of ± 1°C.Design

The RPD shall be designed so as not to interfere with work activities when being carried. It shall be used in accordance with the information supplied by the manufacturer.

The surface of any part of the RPD likely to be in contact with the wearer shall be free from sharp edges, burrs and no protruding parts, that can be caught on projections in narrow passages, or by moving parts.

Check in accordance with 7.2 and test in accordance with 7.11

The RPD shall be so designed and constructed as to prevent ingress of external atmosphere within the limits specified in this document.

Testing shall be performed in accordance with 7.3.

The RPD shall be so designed as to prevent that saliva or condensate to interfere with the function of the RPD or cause any harmful effect to the wearer.

Check in accordance with 7.2 and test in accordance with 7.11.

The RPD shall be so designed to prevent the chemical used in the RPD entering the wearer's respiratory tract.

Under intended condition of use, no migration of any powdered chemical to the RI shall be possible.

A declaration shall be supplied that this was addressed by a risk assessment, e.g. a FMEA.

Check in accordance with 7.2.

It shall not be possible to initiate a quick start system inadvertently, if fitted.

It shall not be possible to don the RPD without initiating the quick start system, if fitted.

For RPD designed for underground use, the additional requirements specified in Annex A shall be fulfilled.

Test in accordance with Annex A.

RPD shall be designed in such a way to minimize the risk to be caught up. Special mechanism or carrying methods can be used to minimize the risk.

A declaration shall be supplied that this was addressed by a risk assessment, e.g. a FMEA.

If a training RPD is available, it shall be clearly distinguishable from the working RPD and shall be marked as such and explained in the information supplied by the manufacturer.

If a training RPD is available, it shall follow the general guidelines in Annex B.

WARNING —Training RPD according to Annex B are not Personal Protective Equipment and therefore, they shall never be used in hazardous conditions.

Check in accordance with 7.2.

6.4 Materials

6.4.1 Corrosion

Under intended condition of use, the carrying container and the locking system, where present, shall be adequately protected against corrosion.

A declaration shall be supplied that this was addressed by a risk assessment, e.g. a FMEA.

Check in accordance with 7.2.

The materials used shall be able to withstand temperatures and mechanical stress to be expected whilst being carried on the person as well as being stored on machines and vehicles.

Check in accordance with 7.2 and test in accordance with 7.4, 7.5.1 and 7.11.

6.4.2 RPD used in potentially explosive atmospheres

6.4.2.1 General

If the RPD is intended to be used in potentially explosive atmospheres the RPD shall be marked accordingly.

6.4.2.2 Exposed components

RPD intended to be used in potentially explosive atmospheres shall not have exposed unprotected metal components manufactured from Aluminium, Magnesium, Titanium, Zirconium or their alloys containing such proportions of these metals which, on impact with rusted iron or steel, are likely to produce sparks capable of igniting flammable gas/air mixtures.

A declaration shall be supplied that this was addressed by a risk assessment, e.g. a FMEA.

Check in accordance with 7.2.

6.4.2.3 Antistatic properties

RPD and exposed components in the ready for use packaging and during the donning of the RPD and in the donned configuration shall be tested in accordance with EN ISO 80079-36: 2016. Testing by charging with a DC high voltage power supply (EN ISO 80079-36:2016, D.4.2.3,) can be excluded, as long as highly efficient charge generating mechanisms (fast separation processes, e.g. films moving over rollers, drive belts, loading arm operation and bulk hydrocarbon transfer) are unlikely to be present. A warning shall be given in the information supplied by the manufacturer.

Exposed components are those that can be touched, during use, by the exposed surface identification probe given in Figure 1.