



SWEDISH  
STANDARDS  
INSTITUTE

# SVENSK STANDARD SS-EN 14529:2005

Fastställd 2005-10-27

Utgåva 1

**Andningsskydd – Bärbar tryckluftapparat med  
öppet system med halvmask med dosering och  
säkerhetstryck endast som flyktutrustning**

**Respiratory protective devices – Self-contained  
open-circuit compressed air breathing apparatus  
with half mask designed to include a positive  
pressure lung governed demand valve for escape  
proposes only**

ICS 13.340.30

Språk: engelska

Publicerad: januari 2006

Europastandarden EN 14529:2005 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 14529:2005.

The European Standard EN 14529:2005 has the status of a Swedish Standard. This document contains the official English version of EN 14529:2005.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14529**

August 2005

ICS 13.340.30

English Version

**Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with half mask designed to include a positive pressure lung governed demand valve for escape purposes only**

Appareils de protection respiratoire - Appareils de protection respiratoire autonomes à circuit ouvert, à air comprimé avec demi-masque et soupape à la demande à commande à la première inspiration, à pression positive, pour l'évacuation uniquement

Atemschutzgeräte - Behältergeräte mit Druckluft (Pressluftatmer) mit Halbmaske in der Ausführung mit einem Überdrucklungenautomaten nur für Fluchtzwecke

This European Standard was approved by CEN on 1 July 2005.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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## **Foreword**

This European Standard (EN 14529:2005) has been prepared by Technical Committee CEN/TC 79 "Respiratory protective devices", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

This European Standard has been prepared under a mandate given to CEN/CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) 89/686/EEC and 97/23/EEC.

For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this European Standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## **EN 14529:2005 (E)**

### **Introduction**

A given respiratory protective device can only be approved when the individual components satisfy the requirements of the test specification which may be a complete European Standard or part of a European Standard and practical performance tests have been carried out successfully on complete apparatus where specified in the appropriate European Standard. If for any reason a complete apparatus is not tested then simulation of the apparatus is permitted provided the respiratory characteristics and weight distribution are similar to those of the complete apparatus.

## 1 Scope

This European Standard specifies minimum requirements for self-contained open-circuit compressed air breathing apparatus with half mask designed to include a positive pressure lung governed demand valve for escape purposes only.

Such equipment is intended for use in work situations where the risk on overpressurisation of the pressure vessels with their valves due to hot environmental conditions is low.

This European Standard does not apply to apparatus for work and rescue or to diving apparatus.

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

## 2 Normative references

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

EN 132:1998, *Respiratory protective devices – Definitions of terms and pictograms*

EN 134:1998, *Respiratory protective devices - Nomenclature of components*

EN 140:1998, *Respiratory protective devices – Half mask and quarter masks – Requirements, testing, marking*

EN 148-1, *Respiratory protective devices - Threads for facepieces - Part 1: Standard thread connection*

EN 148-2, *Respiratory protective devices - Threads for facepieces - Part 2: Centre thread connection*

EN 148-3, *Respiratory protective devices - Threads for facepieces - Part 3: Thread connection for M 45 x 3*

EN 1964-1, *Transportable gas cylinders — Specification for the design and construction of refillable transportable seamless steel gas cylinders of water capacities from 0,5 litre up to and including 150 litres — Part 1: Cylinders made of seamless steel with an  $R_m$  value of less than 1100 MPa*

EN 1964-2, *Transportable gas cylinders — Specification for the design and construction of refillable transportable seamless steel gas cylinders of water capacities from 0,5 litre up to and including 150 litres — Part 2: Cylinders made of seamless steel with an  $R_m$  value of 1100 MPa and above*

EN 1964-3, *Transportable gas cylinders — Specification for the design and construction of refillable transportable seamless steel gas cylinders of water capacity from 0,5 litre up to and including 150 litres — Part 3: Cylinders made of seamless stainless steel with an  $R_m$  value of less than 1100 MPa*

EN 1975, *Transportable gas cylinders - Specification for the design and construction of refillable transportable seamless aluminium and aluminium alloy gas cylinders of capacity from 0, 5 litre up to 150 litre*

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

EN 12245, *Transportable gas cylinders - Fully wrapped composite cylinders*

EN 13274-2:2001, *Respiratory protective devices - Methods of test - Part 2: Practical performance tests*

EN 13274-3:2001, *Respiratory protective devices - Methods of test - Part 3: Determination of breathing resistance*

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EN 13274-4:2001, *Respiratory protective devices - Methods of test - Part 4: Flame tests*

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

### 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 132:1998 and the nomenclature given in EN 134:1998 apply.

### 4 Description

Lung governed demand compressed air escape apparatus are designed and constructed to enable the wearer to breathe air on demand from a pressure vessel(s) either via a pressure reducer and a lung governed demand valve or a lung governed demand valve connected to the half mask. The exhaled air passes without re-circulation from the half mask via the exhalation valve to the ambient atmosphere.

This apparatus typically comprises pressure vessel(s), body harness, lung governed demand valve, pressure indicator(s), warning device (optional), connecting hoses and tubes and a half mask.

### 5 Classification

Lung governed demand compressed air escape apparatus are classified according to the rated working duration (see 6.23.1) which is defined by performing a breathing machine test in accordance with 7.6.4 with a minute volume of 35 l/min (20 cycles/min, 1,75 l/stroke).

Rated working duration is defined in steps of 5 minutes, starting with 5 minutes as a minimum, up to a maximum of 30 min rated working duration, since the necessary escape time is considered to be the classification.

NOTE It should be recognised that the effective duration may vary according to the breathing rate.

### 6 Requirements

#### 6.1 General

In all tests all test samples shall meet the requirements.

Wherever a test clause is referenced, all sub-clauses of the test clause shall apply, unless otherwise stated.

#### 6.2 Ergonomics

The requirements of this European Standard are intended to take account of the interaction between the wearer, the apparatus, and where possible the working environment in which the apparatus is likely to be used. The device shall satisfy 6.3, 6.8 and 6.9.

#### 6.3 Design

The diameter of pressurised parts downstream of the shut-off valve(s) shall not exceed 32 mm.

The apparatus shall be designed so as not to interfere with work activities when carried in accordance with the manufacturers instructions.

The apparatus shall be so designed that there are no protruding parts or sharp edges likely to be caught on projections in narrow passages or that may hurt the wearer.



The apparatus shall be designed to ensure its full function in any orientation.

The ready for use state of the apparatus shall identify the pressure in the pressure vessel(s) prior to use and during storage. In the ready for use state the half mask shall be securely attached to the apparatus. In the case of a permanent installation of the apparatus in a storage container the pressure vessel seal shall be opened automatically upon removal from the storage container. In all cases, once opened, the pressure vessel seal shall be locked in the open position against inadvertent closing.

If the escape apparatus is fitted with a connection for a working breathing apparatus, (e.g. airline apparatus), the connection shall be leak tight.

The use of a supplementary supply shall not be permitted.

The apparatus shall not include a second medium pressure connector or an ambient air bypass.

Testing shall be done in accordance with 7.3 and 7.8.

#### **6.4 Materials**

The carrying container and the locking device, where present, shall be adequately protected against corrosion. The materials used shall be able to withstand temperatures and mechanical stress expected whilst being carried on the man as well as on machines and vehicles.

Testing shall be done in accordance with 7.3, and 7.8 after pre-conditioning according to 7.4.

Exposed parts, i.e. those which may be subjected to impact during use of the apparatus shall not be made of aluminium, magnesium, titanium or their alloys.

To prevent electrostatic charges on non-metal carrying containers, the surface resistance shall not exceed  $10^9 \Omega$ . Where the apparatus is required to be anti-static during escape materials used shall be anti-static as far as it is practicable.

Testing shall be done in accordance with 7.6.6.

Materials which come into direct contact with the wearer's skin and the breathable gas shall not be known to be likely to cause irritation or any other adverse effect to health.

The finish of any part of the apparatus likely to be in contact with the wearer shall be free from sharp edges and burrs.

Testing shall be done in accordance with 7.3 and 7.8.

#### **6.5 Cleaning and disinfecting**

All materials shall be visibly unimpaired after cleaning and disinfection by the agents and procedures specified by the manufacturer.

Testing shall be done in accordance with 7.3 and 7.8.

#### **6.6 Mass**

Where the apparatus is intended to be carried on the wearer for not more than 1 h, the mass of the complete apparatus including carrying container shall not exceed 7,5 kg.

Where the apparatus is intended to be carried on the wearer for more than 1 h, the mass of the complete apparatus including carrying container shall not exceed 5 kg.

The mass of the apparatus, excluding any container, when stored ready for use shall not exceed 7,5 kg.

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Testing shall be done in accordance with 7.1 and 7.3.

### 6.7 Connections

#### 6.7.1 General

The design and construction of the apparatus shall permit its components to be readily separated for cleaning, inspecting and testing. Demountable connections to achieve this shall be readily connected and secured where possible by hand.

Any means for sealing used shall be retained in position when the connection(s) is (are) disconnected during normal use and maintenance.

Where a compressed airline breathing apparatus incorporating a half mask is used in conjunction with an escape breathing apparatus with a half mask as specified by this European Standard, all connections that may have to be disconnected by the wearer whilst wearing the apparatus shall be located so as to be readily accessible to the wearer and designed so as to be easily disconnected without assistance.

Testing shall be done in accordance with 7.3 and 7.8.

#### 6.7.2 Connection between apparatus and half mask

NOTE The connection between the apparatus and the half mask may be achieved by a permanent, special or thread type connector.

If a thread type connector is used it shall not be possible to connect it with the EN 148-1 and EN 148-3 threads.

The thread according to EN 148-2 shall not be used with the equipment covered by this European Standard.

Testing shall be done in accordance with 7.3.

After pre-conditioning in accordance with 7.4 and return to temperatures between 17°C and 23°C the connectors between apparatus and the half mask shall be examined and the performance requirements of the threads shall be satisfied.

For all equipment connectors a pull test as described in 6.11 and 7.8 of EN 140:1998 shall be applied and no separation shall occur and the performance requirements of the threads shall be satisfied.

Testing shall be done in accordance with 7.3.

### 6.8 Harness

The apparatus shall have a harness or other means of carrying so that the wearer's hands are left free, when the apparatus is in use.

Any harness shall be designed to allow quick, easy and correct donning of the apparatus without assistance.

Testing shall be done in accordance with 7.3 and 7.8.

### 6.9 Handling

The apparatus shall be capable of being donned and put into operation simply and without undue exertion under difficult conditions e.g. in the dark and in spaces with restricted areas.

If the apparatus is fitted with a special lock, the design shall be such that it cannot be opened inadvertently. This design criteria shall be checked as part of and prior to testing in accordance with 7.8.

If the apparatus has been opened, this shall be obvious by visual inspection.

Testing shall be done in accordance with 7.3 and 7.8.

### **6.10 Leak tightness**

The ready for use apparatus shall be leak tight so that the pressure change does not exceed 0,3 mbar in 1 min.

Testing shall be done in accordance with 7.6.3.

### **6.11 Half mask**

The half mask shall fulfil the performance requirements of EN 140 when tested as a complete apparatus, except the breathing resistance requirement according to 6.15 of EN 140:1998.

### **6.12 Temperature performance and flammability resistance**

#### **6.12.1 General**

After pre-conditioning according to 7.4 and return to  $(20 \pm 3)$  °C pressure vessels shall be charged to the manufacturer's maximum recommended filling pressure. The apparatus shall meet the requirements of 6.10 and 6.23, the carrying container shall have no deficiencies that impair its functionality, the materials used shall not show substantial deteriorations (severe deformations, cracks etc.) and the connectors between apparatus and half mask shall be examined.

For standardised threads a thread gauge shall be used to check dimensions.

For all equipment connectors a pull test as described in 6.11.2 and 7.8 of EN 140:1998 shall be applied and no separations shall occur.

After the test the equipment connector shall be dimensionally correct.

Testing shall be done in accordance with 7.3.

#### **6.12.2 Temperature performance**

##### **6.12.2.1 General**

The apparatus shall operate trouble-free over the temperature range -15 °C to 60 °C.

Apparatus specifically designed for temperatures beyond these limits shall be tested and marked accordingly. The apparatus shall meet the breathing resistance requirements given in 6.12.2.2 and 6.12.2.3 at the extremes of the temperature given.

##### **6.12.2.2 Breathing resistance at low temperature**

A positive pressure shall be maintained in the half mask.

The exhalation resistance shall not exceed 10 mbar.

Testing shall be done in accordance with 7.6.1.

##### **6.12.2.3 Breathing resistance at high temperature**

A positive pressure shall be maintained in the cavity of the half mask.

The exhalation resistance shall not exceed 10 mbar.

Testing shall be done in accordance with 7.6.2.