



DGUV Test

Prüf- und Zertifizierungsstelle
Fachbereich Rohstoffe und
chemische Industrie

Principles of Testing and Certification of Respiratory Protective Devices in the Field of Raw Materials and Chemical Industry Status 02.2021

GS-RCI-601

DGUV Test Testing and Certification Body of the
Expert Committee for Raw Materials and Chemical Industry
c/o
Berufsgenossenschaft Rohstoffe und chemische Industrie
Theodor-Heuss-Straße 160
D-30853 Langenhagen
Phone: +49 6221 5108-29501
Email: pruefstelle@bgrci.de

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1 Field of Application

These „Principles of Testing and Certification of Respiratory Protective Devices in the Field of Raw Materials and Chemical Industry” (Principles of Testing) contain important technical rules and regulations regarding the testing of occupational safety, of certification and control tests of

respiratory protective devices and open-circuit self-contained diving apparatuses.

They complement the “Rules of Testing and Certification of the Testing and Certification Bodies in DGUV Test” (DGUV principle 300-003).

These principles of testing are to be applied for the Field of the Raw Materials and Chemical Industry. For respiratory protective devices and open-circuit self-contained diving apparatuses an extension beyond the Field of the Raw Materials and Chemical Industry is possible.

After reconciliation with the body of testing (Raw Materials and Chemical Industry) an extension to other Fields and exploitation of the here established principles of testing of other bodies of testing in the DGUV Test association.

Within the field of application of these principles of testing are:

-

In these principles of testing for products those testing requirements are specified referred to in completion of the Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC (hereafter PPE Regulation [EU] 2016/425) as amended in connection with the 8th Regulation on the Act on making products available on the market (Product Safety Act).

2 Terms and Definitions

2.1 General Definition of Terms

Initial Test

Type test and test of corresponding documents after the test application has been accepted. Size and scope of the initial test have to be discussed and reconciled in advance with the principal.

Repeat Test

Type test and/or test of corresponding documents assessing whether deficiencies found during foregone testing have been remedied. The repeat test is performed in consultation with the principal.

Review

Type test and/or test of corresponding documents

- when health and safety requirements have been changed,
- or
- when changes to the products produced have been made

In case of a review a new contract is necessary.

Test by Sampling

Tests to ensure compliance of the serial product with the tested type.

Products

Products are goods, substances, or preparations, that have been produced in a production process. According to the definition of the Product Safety Act it is distinguished between consumer products and non-consumer products. The detailed definition and deviations are to be gathered from the Product Safety Act.

2.2 Specific Definition of Terms

Respiratory Protective Device

A respiratory protective device is a personal protective equipment to protect a person from hazardous substances in the surrounding atmosphere and/or from oxygen deficiency.

Full-Face Mask (According to DIN EN 136)

A full-face mask is a tight fitting respiratory protective device covering mouth, nose, eyes, and chin.

Self-contained open-circuit compressed air breathing apparatus (compressed air breathing apparatuses according to DIN EN 137)

A compressed air breathing apparatus is a respiratory protective device working independently from the surrounding atmosphere with an entrained compressed air supply. The device is freely portable.

Fresh-Air Supply Hose (According to DIN EN 138)

A fresh-air supply hose is a device for use with full face mask, half mask or mouthpiece assembly. It is not freely portable. Breathable fresh air is being supplied by an air source with or without supporting resources.

Half Mask (According to DIN EN 140)

A half mask is a tight fitting respiratory protective device covering mouth, nose, and chin.

Mouthpiece Assembly (According to DIN EN 142)

A mouthpiece assembly is a respiratory protective that is being held with teeth or with teeth and a head harness and is being sealed up on lips. Air is inhaled and exhaled through the mouthpiece assembly while the nose is closed by a clamp.

Open-Circuit Self-Contained Compressed-Air Diving Apparatus (According to DIN EN 250)

An open-circuit self-contained compressed-air diving apparatus (short: SCUBA) is a device with which divers carry a supply of breathing air with them. This enables them to inhale under water and exhale into the surrounding water.

Further terms see in EN 132 and EN 134 as well as in EN or DIN standards given definitions as appropriate.

3 Basis of Testing

The *essential health and safety requirements* are established in the PPE Regulation (EU) 2016/425.

For the testing field of the DGUV Test Testing and Certification Body of the Expert Committee for Raw Materials and Chemical Industry these are concretised in the harmonized

European standards (EN standards) referred to in Annex I table 1 of these principles of testing.

Testing requirements for testing in the non-harmonized field respectively where no European standards are available are compiled in Annex I table 2 and 3.

Additional agreements regarding the basis of testing and the test scope require further contractual determination. These become requisite in individual cases when

- the test cannot be derived from the aforementioned rules and specifications or
- exceeding tests are considered necessary.

4 Local and Objective Responsibilities

- Testing and Certification is conducted by:
- DGUV Test Testing and Certification Body of the Expert Committee for Raw Materials and Chemical Industry
– Testing Body for Respiratory Protective Devices and Open-Circuit Self-Contained Diving Apparatuses –
Unterbau 71 1/8
82383 Hohenpeißenberg
Phone.: 06221 5108 28611
- Head of Test and Certification Body, Contract Management:
DGUV Test Prüf- und Zertifizierungsstelle des Fachbereich Rohstoffe und chemische Industrie (DGUV Test Testing and Certification Body of the Expert Committee for Raw Materials and Chemical Industry)
c/o
Berufsgenossenschaft Rohstoffe und chemische Industrie (German Social Accident Insurance Institution for the Raw Materials and Chemical Industry)
Theodor-Heuss-Straße 160
30853 Langenhagen
Phone.: 06221 5108 29501
- Central tasks for the Test and Certification system of DGUV test:
Geschäftsstelle DGUV Test (Secretariat DGUV Test)
Deutsche Gesetzliche Unfallversicherung (DGUV) (German Social Accident Insurance [DGUV])
Alte Heerstraße 111
53754 Sankt Augustin

5 Procedure of the Testing Process and the Certification Process

Testing will be based on the “Rules of Testing and Certification of the Testing and Certification Bodies in DGUV Test” (DGUV principle 300-003) and a contract between the applicant and the Testing and Certification Body.

5.1 Initiation of the Proceeding

The applicant will receive a questionnaire to fill in all necessary details for the testing of the product. On basis of this competence and feasibility are verified and a quotation will be created accordingly.

5.2 Contract

The applicant will receive a contract about:

- Testing,
- Testing and Certification or
- Controls

and the followings documents:

- Rules of Testing and Certification,
- Principles of Testing GS-RCI-601,
- Schedule of Fees of the Testing and Certification Body,
- Terms and Conditions.
- The contract signed by both parties prevails as placing and acceptance of order.

5.3 Conduct of the Test

For testing samples ready for operation and use in a number determined by the standard respectively the testing body as well as the necessary technical documents need to be submitted freely. All documents of importance for the testing and the proceedings are put together by the testing body and shall be kept in accordance.

If required a knowledgeable representative has to be present during testing to provide the information needed concerning construction, equipment and functionality of the product. If required auxiliary personnel are to be provided by the principal for the implementation of the testing.

5.4 Subcontracting

The Testing and Certification Body is allowed to request certificates, confirmations or surveys of other testing bodies or relevant experts respectively to subcontract partial tests. If subcontracting is necessary for the test commissioned this is made after prior agreement between the principal and the Testing and Certification Body. Testing bodies or relevant experts, that are not to be involved, are to be communicated by the principal at an early stage.

5.5 Test Result and Repeat Tests

Deficiencies detected during the test will be listed in a test protocol and the principal will be informed. A repeat test will only be carried out with prior permission of the principal. Once the principal has remedied the deficiencies, he will inform the test and certification body providing appropriate documentation. Latter will carry out a repeat test on the modified test sample.

5.6 Test Report and Test Certificate

The results of the test will be documented in a test report. The test report including the inspection documents will be endorsed. The test report will be transmitted to the principal or to another body designated by them. In the course of a test and certification procedure the test report and all other relevant documents will be transmitted to the certification body for assessment. If the assessment proves that the product complies with all current safety requirements, a certification report and a certificate according to the Rules of Testing and Certification (DGUV principle 300-003) will be issued and transmitted to the principal.

The certificate is equivalent to the test certificate according to PPE Regulation (EU) 2016/425.

Validity of the test certificate will be restricted for 5 years maximum.

For launching respiratory protective devices and open-circuit self-contained compressed-air diving apparatuses, also control measures according Annex VII (module C2) or Annex VIII (module D) of the PPE Regulation (EU) 2016/425 are compulsory.

Before issuing the certificate the principal has to prove that a contract with a notified body for the control of the PPE manufactured is made.

5.7 Control Measures

If the Testing and Certification Body is commissioned with control measures according Annex VII (module C2), the necessary controls will be carried out on one or more of the series-produced products. The Certification Body will determine the time intervals and the scope. The Certification Body will produce a control report and if applicable issue a test report according to PPE Regulation (EU) 2016/425 Annex VII.

6 Technical Documentation

Along with the test sample the following documentation is to be submitted to the Test and Certification Body:

- a) technical documentation for PPE according to Annex III of the PPE Regulation (EU) 2016/425
- b) description of normally foreseeable implementation according to Annex II Preliminary Remark 5 of the PPE Regulation (EU) 2016/425.

7 Validity

These Principles of Testing will be valid from the issue date given on the cover sheet.

Annex 1: Rules and Regulations

Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC

Note: PPE Regulation (EU) 2016/425 contains requirements regarding the labelling (see Article 8 paragraph 5 and 6) which have not been assumed yet respectively not yet completely into the harmonised standards.

These requirements are:

- type, batch, or serial number or any other identification mark
- name of the manufacturer, registered trade name, or registered trade mark
- postal address, where the manufacturer can be contacted at

Information on PPE itself or, in case this is not possible, on the packaging or in the documents enclosed.

Postal address given needs to be one single contact point for requests to the manufacturer. Contact data need to be given in a language easily understood by end users and market surveillance authorities.

Table 1: Harmonized Standards Under Union Harmonisation Legislation

| Title | |
|------------------------------------|--|
| DIN EN 134:1998-03 | Respiratory protective devices - Nomenclature of components; German version EN 134:1998 |
| DIN EN 135:1999-02 | Respiratory protective devices - list of equivalent terms; German version EN 135:1998 |
| DIN EN 136:1998-04 | Respiratory protective devices - Fullface masks - Requirements, testing, marking; German version EN 136:1997 |
| DIN EN 137:2007-01 | Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking; German version EN 137:2006 |
| DIN EN 138:1994-12 | Respiratory protective devices - Fresh air hose breathing apparatus for use with full face mask, half mask or mouthpiece assembly - Requirements, testing, marking; German version EN 138:1994 |

Table 1: Harmonized Standards Under Union Harmonisation Legislation

| | |
|--------------------------------------|---|
| DIN EN 140:1998-12 | Respiratory protective devices - Half masks and quarter-masks - Requirements, testing, marking; German version EN 140:1998 |
| DIN EN 142:2002-08 | Respiratory protective devices - Mouthpiece assemblies - Requirements, testing, marking; German version EN 142:2002 |
| DIN EN 143:2007-02 | Respiratory protective devices - Particle filters - Requirements, testing, marking; German version EN 143:2000 + AC:2005 + A1:2006 |
| DIN EN 144-1:2018-06 | Respiratory protective devices - Gas cylinder valves - Part 1: Inlet connections; German version EN 144-1:2018 |
| DIN EN 144-2:2018-06 | Respiratory protective devices - Gas cylinder valves - Part 2: Outlet connections; German version EN 144-2:2018 |
| DIN EN 144-3:2003-06 | Respiratory protective devices - Gas cylinder valves - Part 3: Outlet connections for diving gases Nitrox and oxygen; German version EN 144-3:2003 |
| DIN EN 145:2000-06 | Respiratory protective devices - Self-contained closed-circuit breathing apparatus compressed oxygen or compressed oxygen-nitrogen type - Requirements, testing, marking (includes Amendment A1:2000); German version EN 145:1997 + A1:2000 |
| DIN EN 148-1:2019-05 | Respiratory protective devices - Threads for facepieces - Part 1: Standard thread connection; German version EN 148-1:2018 |
| DIN EN 148-2:1999-04 | Respiratory protective devices - Threads for facepieces - Part 2: Centre thread connection; German version EN 148-2:1999 |
| DIN EN 148-3:1999-04 | Respiratory protective devices - Threads for facepieces - Part 3: Thread connection M 45 × 3; German version EN 148-3:1999 |
| DIN EN 149:2009-08 | Respiratory protective devices - Filtering half masks to protect against particles - Requirements, testing, marking; German version EN 149:2001+A1:2009 |
| DIN EN 166:2002-04 | Personal eye-protection - Specifications; German version EN 166:2001 |

Table 1: Harmonized Standards Under Union Harmonisation Legislation

| | |
|--------------------------------------|---|
| DIN EN 168:2002-04 | Personal eye-protection - Non-optical test methods; German version EN 168:2001 |
| DIN EN 250:2014-07 | Respiratory equipment - Open-circuit self-contained compressed air diving apparatus - Requirements, testing and marking; German version EN 250:2014 |
| DIN EN 269:1994-12 | Respiratory protective devices - Powered fresh air hose breathing apparatus incorporating a hood - Requirements, testing, marking; German version EN 269:1994 |
| DIN EN 402:2003-09 | Respiratory protective devices - Lung governed demand self-contained open-circuit compressed air breathing apparatus with full face mask or mouthpiece assembly for escape - Requirements, testing, marking; German version EN 402:2003 |
| DIN EN 403:2004-08 | Respiratory protective devices for self-rescue - Filtering devices with hood for escape from fire - Requirements, testing, marking; German version EN 403:2004 |
| DIN EN 404:2005-07 | Respiratory protective devices for self-rescue - Filter self-rescuer from carbon monoxide with mouthpiece assembly; German version EN 404:2005 |
| DIN EN 443:2008-06 | Helmets for fire fighting in buildings and other structures; German version EN 443:2008 |
| DIN EN 464:1994-09 | Protective clothing - Protection against liquid and gaseous chemicals, including liquid aerosols and solid particles - Test method: Determination of leak-tightness of gas-tight suits (internal pressure test); German version EN 464:1994 |
| DIN EN 943-1:2019-06 | Protective clothing against dangerous solid, liquid and gaseous chemicals, including liquid and solid aerosols - Part 1: Performance requirements for Type 1 (gas-tight) chemical protective suits; German version EN 943-1:2015+A1:2019 protective suits |
| DIN EN 943-2:2019-06 | Protective clothing against dangerous solid, liquid and gaseous chemicals, including liquid and solid aerosols - Part 2: Performance requirements for Type 1 (gas-tight) chemical |

Table 1: Harmonized Standards Under Union Harmonisation Legislation

protective suits for emergency teams (ET); German version EN 943-2:2019

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|---|---|
| <u>DIN EN 1073-1:2018-10</u> | Protective clothing against solid airborne particles including radioactive contamination - Part 1: Requirements and test methods for compressed air line ventilated protective clothing, protecting the body and the respiratory tract; German version EN 1073-1:2016+A1:2018 |
| <u>DIN EN 1146:2005-12</u> | Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus incorporating a hood for escape - Requirements, testing, marking; German version EN 1146:2005 |
| <u>DIN EN 1809:2016-09</u> | Diving equipment - Buoyancy compensators - Functional and safety requirements, test methods; German version EN 1809:2014+A1:2016 |
| <u>DIN EN 1827:2009-11</u> | Respiratory protective devices - Half masks without inhalation valves and with separable filters to protect against gases or gases and particles or particles only - Requirements, testing, marking; German version EN 1827:1999+A1:2009 |
| <u>DIN EN 12083:1998-06</u> | Respiratory protective devices - Filters with breathing (Non-mask mounted filters) - Particle filters, gas filters, and combined filters - Requirements, testing, marking; German version EN 12083:1998 |
| <u>DIN EN ISO 12402-2:2006-12</u> | Personal flotation devices - Part 2: Lifejackets, performance level 275 - Safety requirements (ISO 12402-2:2006); German version EN ISO 12402-2:2006 |
| <u>DIN EN 12628:1999-10</u> | Diving accessories - Combined buoyancy and rescue devices - Functional and safety requirements, test methods; German version EN 12628:1999 |
| <u>DIN EN 12941:2009-02</u> | Respiratory protective devices - Powered filtering devices incorporating a helmet or a hood - Requirements, testing, marking; German version EN 12941:1998+A1:2003+A2:2008 |
| <u>DIN EN 12942:2009-02</u> | Respiratory protective devices - Power assisted filtering devices incorporating full face masks, half masks or quarter masks - |

Table 1: Harmonized Standards Under Union Harmonisation Legislation

Requirements, testing, marking; German version EN 12942:1998+A1:2002+A2:2008

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|--|--|
| DIN EN 13274-1:2001-04 1 | Respiratory protective devices - Methods of test - Part 1: Determination of inward leakage and total inward leakage; German version EN 13274-1:2001 |
| DIN EN 13274-2:2019-10 | Respiratory protective devices - Methods of test - Part 2: Practical performance tests; German version EN 13274-2:2019 |
| DIN EN 13274-3:2002-03 | Respiratory protective devices - Methods of test - Part 3: Determination of breathing resistance; German version EN 13274-3:2001 |
| DIN EN 13274-4:2020-12 | Respiratory protective devices - Methods of test - Part 4: Flame test; German version EN 13274-4:2020 |
| DIN EN 13274-5:2001-10 | Respiratory protective devices - Methods of test - Part 5: Climatic conditions; German version EN 13274-5:2001 |
| DIN EN 13274-6:2002-03 | Respiratory protective devices - Methods of test - Part 6: Determination of carbon dioxide content of the inhalation air; German version EN 13274-6:2001 |
| DIN EN 13274-7:2019-09 | Respiratory protective devices - Methods of test - Part 7: Determination of particle filter penetration; German version EN 13274-7:2019 |
| DIN EN 13274-8:2003-04 | Respiratory protective devices - Methods of test - Part 8: Determination of dolomite dust clogging; German version EN 13274-8:2002 |
| DIN EN 13794:2003-04 | Respiratory protective devices - Self-contained closed-circuit breathing apparatus for escape - Requirements, testing, marking; German version EN 13794:2002 |
| DIN EN 13911:2017-11 | Protective clothing for firefighters - Requirements and test methods for fire hoods for firefighters; German version EN 13911:2017 |

Table 1: Harmonized Standards Under Union Harmonisation Legislation

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|---|--|
| DIN EN 13921:2007-08 | Personal protective equipment - Ergonomic principles; German version EN 13921:2007 |
| DIN EN 13949:2003-06 | Respiratory equipment - Open-circuit self-contained diving apparatus for use with compressed Nitrox and oxygen - Requirements, testing, marking; German version EN 13949:2003 |
| DIN EN 14126:2004-01 | Protective clothing - Performance requirements and test methods for protective clothing against infective agents; German version EN 14126:2003 |
| DIN EN 14126 Berichtigung 1:2005-02 | Corrigenda to DIN EN 14126:2004-01; German version EN 14126:2003/AC:2004 |
| DIN EN 14143:2013-10 | Respiratory equipment - Self-contained re-breathing diving apparatus; German version EN 14143:2013 |
| DIN EN 14225-1:2018-03 | Diving suits - Part 1: Wet suits - Requirements and test methods; German version EN 14225-1:2017 |
| DIN EN 14225-2:2018-03 | Diving suits - Part 2: Dry suits - Requirements and test methods; German version EN 14225-2:2017 |
| DIN EN 14387:2008-05 | Respiratory protective devices - Gas filter(s) and combined filter(s) - Requirements, testing, marking; German version EN 14387:2004+A1:2008 |
| DIN EN 14435:2004-10 | Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with half mask designed to be used with positive pressure only - Requirements, testing, marking; German version EN 14435:2004 |
| DIN EN 14458:2018-10 | Personal eye-equipment - High performance visors intended only for use with protective helmets; German version EN 14458:2018 |
| DIN EN 14529:2006-01 | 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; German version EN 14529:2005 |

Table 1: Harmonized Standards Under Union Harmonisation Legislation

| | |
|---|---|
| DIN EN 14593-1:2018-07 | Respiratory protective devices - Compressed air line breathing devices with demand valve - Part 1: Devices with a full face mask - Requirements, testing and marking; German version EN 14593-1:2018 |
| DIN EN 14594:2018-07 | Respiratory protective devices - Continuous flow compressed air line breathing devices - Requirements, testing and marking; German version EN 14594:2018 |
| DIN EN ISO 14877:2003-01 | Protective clothing for abrasive blasting operations using granular abrasives (ISO 14877:2002); German version EN ISO 14877:2002 |
| DIN EN 15333-1:2008-04 | Respiratory equipment - Open-circuit umbilical supplied compressed gas diving apparatus - Part 1: Demand apparatus; German version EN 15333-1:2008 |
| DIN EN 15333-1 Berichtigung 1:2010-05 | Respiratory equipment - Open-circuit umbilical supplied compressed gas diving apparatus - Part 1: Demand apparatus; German version EN 15333-1:2008, Corrigendum to DIN EN 15333-1:2008-04; German version EN 15333-1:2008/AC:2009 |
| DIN EN 15333-2:2009-07 | Respiratory equipment - Open-circuit umbilical supplied compressed gas diving apparatus - Part 2: Free flow apparatus; German version EN 15333-2:2009 |
| DIN EN ISO 16972:2020-12 | Respiratory protective devices - Vocabulary and graphical symbols (ISO 16972:2020); German version EN ISO 16972:2020 |

* Output data can vary from document to document depending whether the output data is given according to CEN (EN) or according to DIN (DIN EN), possibly also in deviation to the commission communication in the framework of the implementation of PPE Regulation (EU) 2016/425. Normally the output data is given according to DIN, occasionally the first publication date is given according to the aforementioned commission communication of the European Union.

Table 2: Non Harmonized European Standards

Title

| | |
|--|---|
| DIN EN ISO 10297:2017-12 | Gas cylinders - Cylinder valves - Specification and type testing (ISO 10297:2014, Corrected Version 2014-11-01 + Amd.1:2017); German version EN ISO 10297:2014 + A1:2017 |
| DIN EN 12021:2014-07 | Respiratory equipment - Compressed gases for breathing apparatus; German version EN 12021:2014 |
| DIN EN ISO 12209:2017-05 | Gas cylinders - Outlet connections for gas cylinder valves for compressed breathable air (ISO 12209:2013 + Amd 1:2016, Corrected version 2017-03); German version EN ISO 12209:2013 + A1:2016 |
| ISO/TS 16973:2016-04 | Respiratory protective devices - Classification for respiratory protective device (RPD), excluding RPD for underwater application |

Table 3: National Standards

Title

| | |
|------------------------------------|--|
| DIN 3179-1:1982-07 | Classification of respiratory equipment - Survey |
| DIN 58600:2014-12 | Respiratory protective devices - Plug-in connection between lung governed demand valve and facepiece for self-contained open-circuit compressed air breathing apparatus for use by German fire brigade |
| DIN 58610:2014-11 | Respiratory protective devices - Full face masks connected with fire fighters head protection for use as a part of a respiratory protective device - Requirements and tests |
| DIN 58620:2007-02 | Respiratory protective devices - Gas filter(s) and combined filter(s) for protection against carbon monoxide - Requirements, testing, marking |
| DIN 58621:2011-10 | Respiratory protective devices - Reactorfilters for protection against radioactive Methyl iodide and radioactive particles - Requirements, testing, marking |

| | |
|-------------------------------------|--|
| DIN 58639:1998-08 | Respiratory protective devices for self-rescue - Self-contained closed-circuit compressed oxygen breathing apparatus incorporating a hood - Requirements, testing, marking |
| DIN 58651-2:1997-10 | Respiratory protective devices - Self-contained closed-circuit breathing apparatus, compressed oxygen type - Part 2: Short duration-compressed oxygen type for moderate work rates; requirements, testing, marking |
| DIN 58652-1:1997-10 | Respiratory protective devices - Self-contained closed-circuit breathing apparatus - Part 1: Short duration-chemical oxygen (KO ₂) generating type for moderate work rates; requirements, testing, marking |
| DIN 58652-2:1997-10 | Respiratory protective devices - Self-contained closed-circuit breathing apparatus - Part 2: Chemical oxygen (KO ₂) generating type for work and rescue; requirements, testing, marking |
| DIN 58652-3:1997-10 | Respiratory protective devices - Self-contained closed-circuit breathing apparatus - Part 3: Short duration, chemical oxygen (NaClO ₃) generating type for moderate work rates; requirements, testing, marking |
| DIN 58652-4:1997-10 | Respiratory protective devices - Self-contained closed-circuit breathing apparatus - Part 4: Chemical oxygen (NaClO ₃) generating type for work and rescue; requirements, testing, marking |