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Title: Draft BS EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking

Appareils de protection respiratoire - Appareils de protection respiratoire autonomes à circuit ouvert, à air comprimé avec masque complet - Exigences, essais, marquage

Atemschutzgeräte - Behältergeräte mit Druckluft (Pressluftatmer) mit Vollmaske - Anforderungen, Prüfung, Kennzeichnung

This draft European Standard is submitted to CEN members for 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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Contents	Page
European foreword	5
1 Scope.....	6
2 Normative references.....	6
3 Terms, definitions and symbols	7
3.1 Terms and definitions	7
3.2 Symbols	9
4 Description.....	9
5 Classification.....	9
6 Requirements.....	10
6.1 General.....	10
6.2 Values and tolerances	12
6.3 Ergonomics.....	12
6.4 Design.....	12
6.5 Materials	13
6.5.1 General.....	13
6.5.2 Corrosion resistance.....	14
6.6 Submersion	15
6.7 Mass	15
6.8 Connections.....	15
6.8.1 General.....	15
6.8.2 Air supply couplings (if fitted)	15
6.8.3 Air supply connection to full face mask.....	15
6.8.4 Strength of connections to full face mask, demand valve and breathing hose (if fitted).....	16
6.8.5 High, medium and low pressure connections	16
6.8.6 Connection between cylinder shell and valve	16
6.8.7 Connection between cylinder valve and the downstream components	16
6.9 Full face mask.....	16
6.10 Body harness	17
6.11 Practical performance.....	17
6.12 Resistance to temperature and flammability.....	17
6.12.1 Temperature performance	17
6.12.2 Flammability.....	17
6.12.3 Resistance to radiant heat	18
6.13 Protection against particulate matter.....	19
6.14 High and medium pressure parts	19
6.15 Cylinder(s).....	19
6.16 Cylinder valve(s)	19
6.16.1 General.....	19
6.16.2 Optional components	19
6.17 Pressure reducer	20
6.18 Pressure gauge and tube	20
6.18.1 General.....	20
6.18.2 Pressure gauge.....	21
6.19 Warning device.....	21

6.19.1	General	21
6.19.2	Warning device — Pneumatic	22
6.19.3	Warning device — Electronic	22
6.20	Flexible medium pressure connecting tube(s)	22
6.21	Lung governed demand valve	23
6.21.1	Negative Pressure SCBA	23
6.21.2	Positive Pressure SCBA	23
6.21.3	Supplementary air supply	23
6.22	Breathing resistance	23
6.22.1	Inhalation resistance	23
6.22.2	Exhalation resistance	25
6.23	Static pressure	26
6.24	Leak-tightness	26
6.24.1	General	26
6.24.2	Low pressure	26
6.24.3	High pressure	26
6.25	Temperature pre-conditioning	26
6.26	Use of SCBA in potentially explosive atmospheres (optional)	27
7	Testing	27
7.1	General	27
7.2	Inspection	27
7.3	Resistance to temperature and flammability	28
7.3.1	Laboratory tests with a breathing machine	28
7.3.2	Practical performance test	29
7.4	Resistance of the cylinder to extreme temperatures	29
7.5	Pressure reducer	29
7.5.1	General	29
7.5.2	Pressure reducer relief valve	30
7.6	Warning device	30
7.7	Leak-tightness	30
7.7.1	Low pressure test	30
7.7.2	High pressure test	31
7.8	Air-tightness	31
7.9	Submersion	31
7.10	Strength of connections to full face mask, demand valve and breathing hose (if fitted)	31
7.11	Resistance to collapse of breathing hose	32
7.11.1	Principle	32
7.11.2	Apparatus	32
7.11.3	Procedure	32
7.12	Practical performance	32
7.12.1	General	32
7.12.2	Walking test	32
7.12.3	Work simulation test	33
8	Marking	33
8.1	General	33
8.2	Cylinder	34
9	Information supplied by the manufacturer	34
9.1	General	34
9.2	Cylinder	35
Annex A	(normative) Second medium pressure connector	36

A.1	General.....	36
A.1.1	Outlet connector.....	36
A.1.2	Inlet connector.....	36
A.1.3	Combined connector.....	36
A.2	Requirements.....	36
A.2.1	General.....	36
A.2.2	Use as outlet connector.....	36
A.2.3	Use as inlet connector	37
A.3	Information supplied by the manufacturer	37
Annex B (normative)	Ambient air bypass device.....	38
B.1	General.....	38
B.2	Requirements.....	38
B.3	Information supplied by the manufacturer	38
Annex C (normative)	Drop test for multiple cylinder devices.....	40
Annex D (normative)	Interchangeability of the cylinder with the basic part of the SCBA	42
D.1	General.....	42
D.2	Requirements.....	42
D.2.1	Cylinder shell.....	42
D.2.2	Cylinder valve.....	42
D.2.3	Connection between cylinder shell and cylinder valve.....	42
D.2.4	Connection between cylinder valve and downstream components.....	42
D.2.5	Mass	43
D.2.6	Dimensions of the cylinder.....	43
D.2.6.1	General.....	43
D.2.6.2	Use of dimensional gauge for the cylinder.....	43
D.2.7	Dimensions of the basic part of SCBA	44
D.2.7.1	General.....	44
D.2.7.2	Use of dimensional gauge for the basic part	44
D.3	Marking	47
D.4	Information supplied by the manufacturer	47
Annex ZA (informative)	Relationship between this European Standard and the essential health and safety requirements of Regulation 2016/425/EU [2016 OJ L81] aimed to be covered	49
Bibliography		51

European foreword

This document (prEN 137:2025) has been prepared by Technical Committee CEN/TC 79 “Respiratory protective devices”, the secretariat of which is held by DIN.

This document is a working document.

This document will supersede EN 137:2006.

prEN 137:2025 includes the following significant technical changes with respect to EN 137:2006:

- a) risk assessment, required in specific clauses;
- b) tolerance of ± 5 % on temperature limits not otherwise specified and of ± 1 °C on those specified;
- c) reference to EU Directive 2014/68 on dimensions of pressurized parts;
- d) test on corrosion resistance according to EN ISO 9227:2022;
- e) flame engulfment according to ISO 16900-10:2015, 6.2.5;
- f) elevated heat test;
- g) drop test for multiple cylinder devices (Annex C);
- h) use IN potentially explosive atmospheres;
- i) optional requirements regarding interchangeability of cylinders (Annex D);
- j) optional requirements regarding the Personal Alert Safet System (3.1.11).

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.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

1 Scope

This document specifies minimum performance requirements for self-contained breathing apparatus (SCBA), except escape device and diving device.

This document specifies in the Annex D optional requirements regarding the interchangeability of the cylinder for single-cylinder SCBA.

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

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.

EN 136:1998¹, *Respiratory protective devices — Full face masks — Requirements, testing, marking*

EN 144-1:2018, *Respiratory protective devices — Gas cylinder valves — Part 1: Inlet connections*

EN 144-2:2018, *Respiratory protective devices — Gas cylinder valves — Part 2: Outlet connections*

EN 148-1:2018, *Respiratory protective devices — Threads for facepieces — Standard thread connexion*

EN 148-2:1999, *Respiratory protective devices — Threads for facepieces — Centre thread connection*

EN 148-3:1999, *Respiratory protective devices — Threads for facepieces — Part 3: Thread connexion M 45 x 3*

EN 837-1:1996², *Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing*

EN 12245:2022, *Transportable gas cylinders — Fully wrapped composite cylinders*

EN 12257:2002, *Transportable gas cylinders — Seamless, hoop-wrapped composite cylinders*

EN 13274-2:2019, *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*

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

EN ISO 9227:2022³, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2022)*

EN ISO 9809-2:2019, *Gas cylinders — Design, construction and testing of refillable seamless steel gas cylinders and tubes — Part 2: Quenched and tempered steel cylinders and tubes with tensile strength greater than or equal to 1 100 MP (ISO 9809-2:2019)*

EN ISO 10297:2024, *Gas cylinders — Cylinder valves — Specification and type testing (ISO 10297:2024, Corrected version 2024-05)*

¹ This normative reference is impacted by a corrigendum: EN 136:1998/AC:2003.

² This normative reference is impacted by a corrigendum: EN 837-1:1996/AC:1998.

³ This normative reference is impacted by an amendment : EN ISO 9227:2022/A1:2024.

ISO 16900-10:2015, *Respiratory protective devices — Methods of test and test equipment — Part 10: Resistance to ignition, flame, radiant heat and heat*

EN ISO 80079-36:2016⁴, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements*

EN IEC 60079-0:2018⁵, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements (IEC 60079-0:2017)*

EN IEC 61000-6-2:2019, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity standard for industrial environments (IEC 61000-6-2:2016)*

ISO 11119-2:2020, *Gas cylinders — Design, construction and testing of refillable composite gas cylinders and tubes — Part 2: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450 l with load-sharing metal liners*

ISO 11119-3:2020, *Gas cylinders — Design, construction and testing of refillable composite gas cylinders and tubes — Part 3: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450 l with non-load-sharing metallic or non-metallic liners or without liners*

3 Terms, definitions and symbols

For the purposes of this document, the terms and definitions given in EN ISO 16972:2020 and EN 134:2024 and the following apply.

3.1 Terms and definitions

3.1.1

basic part of SCBA

SCBA without mask nor cylinder

3.1.2

self-contained breathing apparatus

SCBA

self-contained open-circuit compressed air breathing apparatus with full face mask

3.1.3

cylinder

sub-assembly of SCBA generally comprising:

- cylinder shell;
- cylinder valve;
- label or other means of identifying the manufacturer of the cylinder body and of the cylinder-valve-assembly;
- optional: pressure indicator, excess flow device, bursting disc, cylinder protection device, dip tube or filter with the dip tube or other

⁴ This normative reference is impacted by a corrigendum: EN ISO 80079-36:2016/AC:2019.

⁵ This normative reference is amended by: EN IEC 60079-0:2018/A11:2024; by an EN IEC 60079-0:2018/prAB; And is impacted by a corrigendum: EN IEC 60079-0:2018/AC:2020-0.

3.1.4

rated working pressure

maximum allowable pressure (PS) for which the equipment is designed, as specified by the manufacturer

3.1.5

working pressure

settled pressure of compressed air at a uniform reference temperature of 15 °C in a fully charged cylinder, in bar

3.1.6

bursting disc

device intended to protect pressurised cylinders against overpressure

3.1.7

excess flow device

EFV

device that limits, in the event of rupture of the valve or unwanted opening, the flow of air exiting from the cylinder

3.1.8

pressure indicator

device indicating the presence or absence of pressure

3.1.9

cylinder valve

device which, when closed, prevents the flow of compressed air from cylinder

3.1.10

cylinder shell

recipient without valve designed to contain pressurized air

3.1.11

Personal Alert Safety System (PASS)

device that continually senses for lack of movement of the wearer and automatically activates the alarm signal, indicating the wearer needs assistance, but can also be manually activated to trigger the alarm

Note 1 to entry: PASS can be an integrated device with dispersed components, incorporated into the construction or assembly of SCBA.

Note 2 to entry: PASS can have key(s) device(s) that activate(s) and/or de-activate(s) it. Different methods exist.

Note 3 to entry: The activation key can be e.g. removable, a smart card, a pressure activation, a push button or an electronic signal.

Note 4 to entry: For de-activation, an intentional action via a removable key, smart card, push button or electronic signal might be applied.

Note 5 to entry: See BS 10999:2010.

3.1.12

alarm signal

PASS-audible warning that is identifiable as an indication that a person needs assistance

3.1.13

pre-alarm signal

PASS-audible warning that is identifiable as an indication that a PASS is about to sound the alarm signal

3.2 Symbols

3.2.1

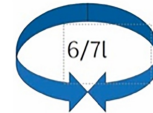
basic parts and cylinders both showing the following symbols are compatible to one another and can be interchanged



Cylinder

50 mm × 65 mm

Minimum



Backplate

10,8 mm × 15 mm

4 Description

This SCBA comprises cylinder(s) and typically *body harness, lung governed demand valve, pressure reducer, pressure indicator or gauge, warning device(s), connecting hoses or tubes and full face mask.*

It may include *pressure reducer relief valve, supplementary air supply, secondary medium pressure connector(s), ambient air bypass device, a PASS device or other accessories.*

The SCBA functions by enabling the wearer to breathe air on demand supplied from compressed air cylinder(s). The exhaled air from the wearer then passes without re-circulation to the ambient atmosphere.

5 Classification

Self-contained open-circuit compressed air breathing SCBA are classified as follows;

- Type 1: SCBA meeting basic requirements;
- Type 2: SCBA meeting higher requirements.

Type 1 is intended for use for planned activities not in high temperature environments where the exposure to flames or radiant heat is not expected.

Type 2 is intended for use by fire and rescue services and considers the tactical procedures including internal attacks (structural firefighting) of European fire services and established training methods.

The requirements of Type 2 include those provided by Type 1.

6 Requirements

6.1 General

For all SCBA being tested, pre-conditioning in accordance with 6.25 shall be performed.

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

Table 1 gives the requirement, number of samples, pre-conditioning and test clause numbers.

Table 1 — Test schedule

Requirement	Title	Number of test samples ^a		Conditioning	Test clause	Associated requirements
		Type 1	Type 2			
6.5.2	Corrosion resistance	1	1	EN ISO 9227:2022	7.2, 7.8	
6.6	Submersion	1	1	6.25	7.9	
6.8 Connections						
6.8.1	General	2	2	6.25	7.2, 7.12	
6.8.2	Air supply couplings (if fitted)	2	2	6.25	7.2, 7.12	
6.8.4	Strength of connections to full face mask, demand valve and breathing hose (if fitted)	1 mask, 1 LDV ^b	1 mask, 1 LDV ^b	6.25	7.10	
6.10	Body harness	2	2	6.25	7.12	
6.11	Practical performance	2	2	7.3.2.1.1	7.3.2	
6.12.2 Flammability						
6.12.2.1	Components	1	1	6.25	7.2, 7.3.1.3, 7.7	
6.12.2.2	Flame engulfment	X	1	6.25	ISO 16900-10:2015, 6.2.5, 7.2	6.22
6.12.2.3	Elevated heat test	X	1	6.25	ISO 16900-10:2015, 6.2.5, 7.2	6.22

Requirement	Title	Number of test samples ^a		Conditioning	Test clause	Associated requirements
		Type 1	Type 2			
6.12.3	Resistance to radiant heat	X	1	6.25	EN 136:1998, 8.6	6.22
6.17 Pressure reducer						
6.17	Reducer relief valve	1	1	6.25	7.2, 7.5.1 and 7.5.2	
6.18	Pressure gauge and tube	1	1	6.25	7.2 m), 7.9, 7.12	EN 837-1:1996, Clause 6
6.19	Warning device	1	1	6.25	7.2 m), 7.6	
6.21	Lung governed demand valve	2	2	6.25	7.2 m)	
6.22.1 Inhalation resistance						
6.22.1.2	Negative pressure SCBA	2	2	6.25	EN 13274-3:2001, method 2, settings E and H	
6.22.1.3	Positive pressure SCBA	2	2	6.25	EN 13274-3:2001, method 2, settings E and H	
6.22.1.4.1	Low temperatures	2	2	6.25	7.3.1.1	
6.22.1.4.2	High temperatures	2	2	6.25	7.3.1.2	
6.22.2 Exhalation resistance						
6.22.2.3	Negative pressure SCBA	2	2	6.25	EN 13274-3:2001, method 2, settings E and H	
6.22.2.4	Positive pressure SCBA	2	2	6.25	EN 13274-3:2001, method 2, settings E and H	
6.22.2.5.1	Low temperatures	2	2	6.25	7.3.1.1	
6.22.2.5.2	High temperatures	2	2	6.25	7.3.1.2	
6.23 Static pressure						
6.23	Static pressure	2	2	6.25	7.2	
6.24 Leak-tightness						
6.24.2	Low pressure	1	1	6.25	7.7.1	
6.24.3	High pressure	1	1	6.25	7.7.2	

Requirement	Title	Number of test samples ^a		Conditioning	Test clause	Associated requirements
		Type 1	Type 2			
^a Samples can be used for more than one test. ^b LDV is the abbreviation for lung governed demand valve.						

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

NOTE Further information is given in EN IEC 60812:2018 [1].

Where fitted, auxiliary equipment identified in Annexes A, B and D shall in addition meet the requirements listed in those annexes.

To ensure the interchangeability of cylinder-valve-assemblies optional requirements are specified. This applies to single cylinder SCBA which comply with the requirements of this document.

Interchangeability can only be claimed on components which have passed the tests as a complete SCBA.

6.2 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.

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

6.3 Ergonomics

The requirements of this document are intended to take account of the interaction between the wearer, the SCBA, and where possible the working environment in which the SCBA is likely to be used. The SCBA shall meet the requirements specified in 6.4, 6.10 and 6.11.

6.4 Design

6.4.1 The design of the SCBA shall be such as to allow the inspections to be performed in accordance with the information supplied by the manufacturer.

Check in accordance with 7.2.

6.4.2 The diameter of pressurized parts with a pressure greater than 0,5 bar downstream of the cylinder valve(s) shall not exceed DN 32 mm to ensure safe use evaluated as per the sound engineering practice. (See EU Directive 2014/68)

Check compliance to this in the technical file.

The SCBA shall be robust to withstand the rough usage it is likely to receive in service.

Testing shall be performed in accordance with 7.12.

6.4.3 Any part of the SCBA likely to be in contact with the wearer shall be free from sharp edges and burrs.

The SCBA shall not have protruding parts that can be caught on projections in narrow passages or by moving parts.

All parts requiring manipulation by the wearer shall be readily accessible and easily distinguishable from one another by touch. All adjustable parts and controls shall be constructed so that their adjustment is not liable to cause accidental alteration during use.

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

Check in accordance with 7.2 and test in accordance with 7.12.

6.4.4 The device shall be so designed that the wearer can remove it and, while still wearing the full face mask, continue to breathe from the device.

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

The cylinder valve(s) of cylinder(s) shall be arranged so that the wearer can operate it (them) while wearing the device.

Testing shall be performed in accordance with 7.12.

6.4.5 If devices (of the same type) are designed for use with different sizes of cylinders, changing of cylinders shall be possible without the use of special tools.

It shall not be possible to simultaneously fit two or more cylinders of different working pressures to the same basic part of SCBA.

It shall not be possible to fit a basic part of SCBA which is designed to operate with a lower rated working pressure to a cylinder with a higher working pressure.

Check in accordance with 7.2.

6.4.6 The cylinder shall comply with a recognized standard, e.g. EN ISO 9809-2:2019 for Type I, EN 12257:2002 for Type II and EN 12245:2022 for Type III, IV and V.

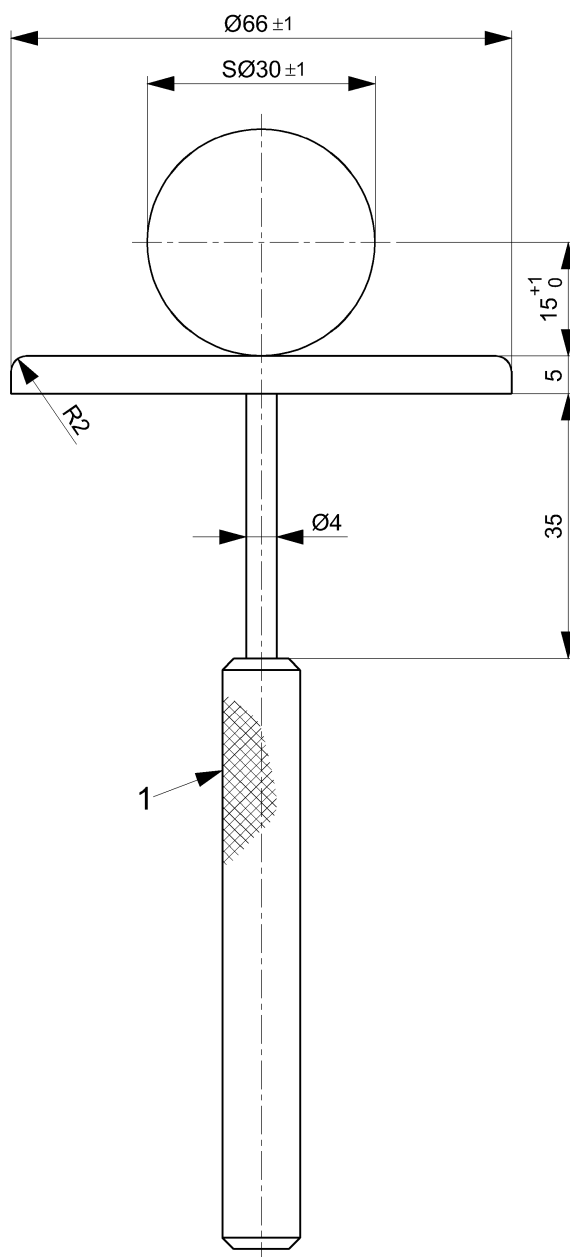
Check in accordance with 7.2.

6.5 Materials

6.5.1 General

All materials shall have adequate resistance to deterioration by temperature and flammability as specified in 6.12 and adequate mechanical strength as specified in 6.8, 6.14, 6.20.

SCBA shall not have exposed unprotected metal components manufactured from Magnesium, Titanium, Aluminium, or of their alloys, containing these metals which, on impact with rusted iron or steel, are likely to produce sparks capable of igniting flammable gas/air mixtures. Protective surface finishes include, but are not limited to, thermal spray, anodizing, powder coating, hard coating, and liquid paint. Exposed components are those that can be touched, during use, by the exposed surface identification probe given in Figure 1.

**Key**

- 1 handle at the discretion of the manufacturer

Figure 1 — Exposed surface identification probe

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

The manufacturer shall supply a declaration that this was addressed by a risk assessment, e.g. a FMEA.

Check in accordance with 7.2 and test in accordance with 7.12.

6.5.2 Corrosion resistance

The following is mandatory for SCBA of Type 2 and optional for SCBA of Type 1.