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Respiratory protective devices — Vocabulary and graphical symbols

Appareils de protection respiratoire — Vocabulaire et symboles graphiques

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Foreword

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This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 15, *Respiratory protective devices*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 79, *Respiratory protective devices*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 16972:2010), which has been technically revised. The main changes compared with the previous edition are as follows:

— the terms used in the field of respiratory protective devices (RPD) have been updated;

— Clause 5, “Units of measurement”, has been deleted;

— Annex A, “Terms and definitions referring to respiratory protective devices in current national standards, regulations or other national contexts”, has been deleted;

— Annex B, “Abbreviations used”, has been deleted.

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.

Respiratory protective devices — Vocabulary and graphical symbols

1 Scope

This document defines terms and specifies units of measurement for respiratory protective devices (RPDs), excluding diving apparatus. It indicates graphical symbols that can be required on RPDs, parts of RPD or instruction manuals in order to instruct the person(s) using the RPD as to its operation.

NOTE Terms and definitions for diving apparatus are given in EN 250.

2 Normative references

There are no normative references in this document.

3 Terms related to respiratory protective devices

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

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

3.1
abrasive blasting respiratory protective device
breathing apparatus (3.32) incorporating a protective *hood* (3.115) or a *blouse* (3.23) fitted with an *impact resistant* (3.119) *visor* (3.252)

Note 1 to entry: *Breathable air* (3.28) is supplied to the *wearer* (3.257) from a source of air not carried by the wearer.

3.2
accessory
item, or items, that are attached to the *respiratory protective device (RPD)* (3.203) that are not necessary for the RPD to meet the requirements of the RPD performance standard and do not compromise its protection

3.3
adequacy assessment
selection method identifying the *respiratory protective device* (3.203) is able to reduce the *wearer's* (3.257) inhalation exposure to acceptable levels

3.4
adequate respiratory protective device
adequate RPD
RPD (3.203) capable of reducing the inhalation exposure to an acceptable level

3.5
aerodynamic diameter
diameter of a unit density sphere having the same settling velocity as the *particle* (3.170) in question

3.6
aerosol
suspension of solid, liquid, or solid and liquid *particles* (3.170) in a gaseous medium, having a negligible falling velocity (generally considered to be less than 0,25 m/s)

3.7
aerosol penetration
ability of *particles* (3.170) to pass through a particle-filtering material

3.8
air flow resistance
pressure difference between upstream and downstream locations caused by the flow of air through the parts and components of a *respiratory protective device* (3.203) such as an *exhalation valve* (3.79), *inhalation valve* (3.120), *filter(s)* (3.86), and *tube* (3.245), etc.

3.9
air supply hose
fresh air supply hose
hose (3.116) for the supply of air at about atmospheric pressure

3.10
ambient air bypass
means to enable the *wearer* (3.257) to breathe the *ambient atmosphere* (3.12) before entering and after leaving a *hazardous atmosphere* (3.108)

3.11
ambient air system
device used to deliver ambient air at a *low pressure* (3.134) directly to a *breathable gas* (3.29) *respiratory protective device* (3.203) (manually or power assisted)

3.12
ambient atmosphere
air surrounding the *wearer* (3.257)

3.13
ambient concentration
concentration of a compound in the air surrounding the *wearer* (3.257)

3.14
ambient laboratory conditions
atmosphere where the temperature is between 16 °C and 32 °C and the relative humidity is between 20 % and 80 %

3.15
apertometer
extended hemispherical dome for measuring the angular area of the *field of vision* (3.85) [*peripheral isopter* (3.176)] of a *respiratory protective device* (3.203) when mounted on a *respiratory protective device headform* (3.204)

3.16
as received
not preconditioned or modified to carry out a test

3.17
assigned protection factor
APF
anticipated level of respiratory protection that would be provided by a properly functioning *respiratory protective device (RPD)* (3.203) or class of RPD within an effective *RPD programme* (3.207)

3.18
assisted filtering respiratory protective device
assisted filtering RPD
filtering RPD (3.90) where *breathable gas* (3.29) is actively supplied to the *wearer* (3.257) by the *RPD* (3.203)

3.19
averaged interactive flow rate
interactive flow rate (3.126) averaged over 10 consecutive *breathing cycles* (3.34) of the *breathing machine* (3.38)

3.20
averaged maximum interactive flow rate
average of the highest *flow rate* (3.92) within each *breathing cycle* (3.34) of 10 consecutive breathing cycles of the *breathing machine* (3.38)

3.21
averaged minimum interactive flow rate
average of the lowest *flow rate* (3.92) within each *breathing cycle* (3.34) of 10 consecutive breathing cycles of the *breathing machine* (3.38)

3.22
averaged peak interactive flow rate
average of the maximum peak *flow rate* (3.92) within each *breathing cycle* (3.34) of 10 consecutive breathing cycles of the *breathing machine* (3.38)

3.23
blouse
garment, used as a *facepiece* (3.83), that covers the head and upper part of the body to the waist and wrists and to which air is supplied

3.24
body harness
means to enable certain components of a *respiratory protective device* (3.203) to be worn on the body

3.25
body temperature pressure saturated
BTPS
standard condition for the expression of *ventilation* (4.20) parameters

Note 1 to entry: Body temperature (37 °C), atmospheric pressure 101,3 kPa and water vapour pressure (6,27 kPa) in saturated air.

3.26
breakthrough concentration
concentration of test *gas* (3.97) in effluent air at which a *gas filter* (3.98) undergoing a gas *capacity* (3.44) test is deemed exhausted

3.27
breakthrough time
t_{br}
time taken from the start of the test until the test *gas* (3.97) and specified reaction products are detected at the specified *breakthrough concentration* (3.26) at the downstream side of the *filter* (3.86) under test

3.28
breathable air
air of a quality that makes it suitable for safe respiration

Note 1 to entry: For compressed air for *breathing apparatus* (3.32), see EN 12021:2014.

3.29
breathable gas
mixture of *gases* (3.97) that is suitable for respiration without adverse effects to health

3.30
breathable gas cylinder
integral part of the *respiratory protective device* (3.203) that contains the *breathable gas* (3.29) supply

3.31
breathable gas quality
composition of a *breathable gas* (3.29) as defined in relevant standards

3.32
breathing apparatus
device that enables the *wearer* (3.257) to breathe independently of the *ambient atmosphere* (3.12)

3.33
breathing bag
component of a *respiratory protective device* (3.203) that compensates for variations in the *breathable gas* (3.29) supply or demand and provides for peak inhalation flow requirements

3.34
breathing cycle
respiratory period comprising an inhalation and an exhalation phase

3.35
breathing frequency
number of *breathing cycles* (3.34) taken in a minute

Note 1 to entry: It is expressed in breaths per minute.

3.36
breathing gas regeneration
process whereby a *respiratory protective device* (3.203) absorbs carbon dioxide from exhaled *gas* (3.97), delivers oxygen, and controls the water vapour and temperature of gas to be rebreathed

3.37
breathing hose
<low pressure> flexible *hose* (3.116) connected to the *facepiece* (3.83) through which *breathable gas* (3.29) enters at atmospheric pressure or at a pressure slightly above or below

3.38
breathing machine
ventilation machine that simulates respiratory *ventilation* (4.20) using waveforms, which can be sinusoidal or representative of the *breathing cycle* (3.34)

Note 1 to entry: See also *metabolic simulator* (3.149).

3.39
breathing machine assembly
breathing machine (3.38) plus all the connecting *tubes* (3.245), control valves and other necessary hardware leading to the *trachea tube assembly* (3.244)

3.40
breathing peak resistance
maximum differential pressure of a *respiratory protective device* (3.203) during inhalation (inhalation peak resistance) or exhalation (exhalation peak resistance)

3.41
breathing resistance
pressure differential between the upstream and downstream location caused by a *respiratory protective device* (3.203) to the flow of *breathable gas* (3.29) during inhalation (inhalation resistance) or exhalation (exhalation resistance)

3.42
breath-responsive
actively or passively responsive following the *wearer's* (3.257) demand for air

3.43
bypass valve
component part of a *respiratory protective device* (3.203) that is furnished as an emergency manual valve to supply necessary *breathable gas* (3.29) when the ordinary supply path is out of order

3.44
capacity
volume of available *breathable gas* (3.29) of a *respiratory protective device* (3.203)

3.45
carbon dioxide concentration limits
CO_2 concentration limits
maximum allowed concentration of carbon dioxide within *inhaled breathable gas* (3.121)

3.46
char length
length of brittle residue found when a fabric or material is exposed to thermal energy

3.47
checking device
means to enable the *wearer* (3.257) to verify, before use or periodically during use, that the *manufacturer's minimum design conditions* (3.137) are met

3.48
class Sxxxx respiratory protective device
class Sxxxx RPD
supplied breathable gas RPD (3.236), where Sxxxx equals the amount of *breathable gas* (3.29) available for respiration in litres

3.49
cleaning/disinfection resistance
ability of the device to withstand the cleaning and disinfection processes defined by the manufacturer

3.50
combined filter
filter (3.86) intended to remove dispersed solid and/or liquid *particles* (3.170) and specified *gases* (3.97) and *vapours* (3.251) from the flow of air passing through it

3.51
combined respiratory protective device
combined RPD
RPD (3.203) that is capable of operating in either a filtering or *breathable gas* (3.29) supply mode

3.52
compatibility
ability of a *respiratory protective device* (3.203) to be used in conjunction with another item of personal protective equipment (PPE)

3.53
competent fit-test operator
person with suitable and sufficient experience and with practical and theoretical knowledge of fit-test methods who conducts the fit-testing procedures

3.54
competent person
person with suitable and sufficient experience and with practical and theoretical knowledge of the elements of a *respiratory protective device programme* (3.207) for which (s)he is responsible

3.55
compressed air filter
filter (3.86) intended to remove dispersed solid and/or liquid *particles* (3.170) and specified *gases* (3.97) and *vapours* (3.251) from compressed air passing through it

3.56
compressed air line breathing apparatus
device that is not self-contained and in which the *facepiece* (3.83) is supplied with *breathable air* (3.28) from a source of compressed air

3.57
compressed air supply tube
tube (3.245) that delivers *breathable air* (3.28) at a maximum pressure of 10 bar from a source of compressed air

3.58
confined space
area with limited access, as described in national regulations, which requires special considerations for entry

3.59
contaminant
undesirable solid, liquid or gaseous substance in the air

3.60
continuous control flow valve
control valve that provides the *wearer* (3.257) of a *supplied breathable gas respiratory protective device* (3.236) with *breathable gas* (3.29) and allows the wearer to regulate a continuous air flow within prescribed limits

3.61
count median diameter
CMD
particle size of a particle distribution for which one-half the total number of *particles* (3.170) are larger and one-half are smaller

3.62
dead space
<technical> space in which exhaled *gas* (3.97) has not been purged and is subject to being rebreathed

3.63
dead space
<anatomical> conducting regions of the pulmonary airways that do not contain *alveoli* (4.7) and, therefore, where no *gas* (3.97) exchange occurs

Note 1 to entry: These areas include the nose, mouth, trachea, large bronchia and the lower branching airways. This volume is typically 150 ml in a male of average size.

3.64
dead space
<physiological> sum of all anatomical *dead space* (3.63) as well as under-perfused (reduced blood flow) *alveoli* (4.7) that are not participating in *gas* (3.97) exchange

Note 1 to entry: The volume of the physiological dead space can vary with the degree of *ventilation* (4.20). Thus, the physiological dead space is the fraction of the *tidal volume* (3.240) that does not participate in gas exchange in the lungs.

3.65
demand type with positive pressure
type of *respiratory protective device* (3.203) that is fitted with a *demand valve* (3.67), is governed by the breathing action of the lungs, and that actuates at a *positive pressure* (3.179) in the *facepiece* (3.83) under conditions defined in relevant standards

3.66
demand type without positive pressure
type of *respiratory protective device* (3.203) that is fitted with a *demand valve* (3.67), is governed by the breathing action of the lungs, and that actuates at a *negative pressure* (3.161) during inhalation in the *facepiece* (3.83)

3.67
demand valve
valve that is governed by the breathing action of lungs and that supplies *breathable gas* (3.29) on demand

3.68
desorption
process in which one substance (the filter medium) releases an absorbed or adsorbed substance

3.69
dew point
temperature of air at a specified pressure below which condensation will occur

3.70
doffing
process of removing or taking off the *respiratory protective device* (3.203)

3.71
donning
process of putting on the *respiratory protective device* (3.203)

3.72
downstream valve
valve that opens with the pressure of the air and is normally kept shut by means of a spring

3.73
drip
to run or fall in drops or blobs

3.74
dynamic breathing resistance
differential pressure caused by a *respiratory protective device* (3.203) when the *breathable gas* (3.29) is delivered by a *breathing machine* (3.38) adjusted to a specified breathing *minute volume* (3.153) and waveform

3.75
dynamic flame test
test where the specimen is moving over the flame for the exposure

3.76
elastance
E
pressure change resulting from a volume change

Note 1 to entry: It is expressed in kPa/l.

3.77
end-of-service-life indicator
ESLI
system that warns the *wearer* (3.257) of the *gas filtering respiratory protective device* (3.102) of the approach of the end of respiratory protection

3.78
escape respiratory protective device
escape RPD
RPD (3.203) designed to be used only during an escape from *hazardous atmospheres* (3.108)

3.79
exhalation valve
non-return valve that allows the release of exhaled and excess *breathable gas* (3.29) from the *respiratory protective device* (3.203)

3.80
exhaled air
air breathed out by the *wearer* (3.257)

3.81
exposed part
part that can be touched in an as-worn state by the exposed surface identification probe specified in ISO 16900-5

3.82
face blank
main body of a *facepiece* (3.83) to which the functional components are attached

3.83
facepiece
part of a *respiratory protective device* (3.203) that connects the *wearer's* (3.257) respiratory tract to the other parts of the device and isolates the respiratory tract from *ambient atmosphere* (3.12)

Note 1 to entry: Facepieces may be *full face masks* (3.96), *half masks* (3.104), *quarter masks* (3.192), *mouthpiece assemblies* (3.157) or *filtering facepieces* (3.89).

Note 2 to entry: *Helmets* (3.113), *hoods* (3.115), *blouses* (3.23) and suits may serve the same purpose.

3.84
face-seal leakage
leakage between the *wearer's* (3.257) face and the *respiratory interface* (3.202)

3.85
field of vision
area of fixed sight while wearing a *respiratory protective device* (3.203)

3.86
filter
device intended to remove specific *contaminants* (3.59) from the ambient air passing through it

3.87
filter holder
filter housing
component that is attached to either a *respiratory interface* (3.202) or another part of the *respiratory protective device* (3.203) and into which a *filter* (3.86), either encapsulated or un-encapsulated, is inserted

3.88
filter self rescuer
respiratory protective device (3.203) exclusively intended for escape, incorporating a *filter* (3.86) against carbon monoxide through which the ambient air is drawn to a *facepiece* (3.83)

3.89
filtering facepiece
respiratory protective device (3.203) entirely or substantially constructed of filtering material

Note 1 to entry: Marked "FF" for filtering facepiece.

3.90
filtering respiratory protective device
filtering RPD
assisted or unassisted *RPD* (3.203) in which air passes through a *gas filter(s)* (3.98), *particle filter(s)* (3.171) or *combined filter(s)* (3.50) before being inhaled

3.91
fit test
use of a challenge agent and specific protocol to qualitatively or quantitatively determine the effectiveness of the seal between the *wearer's* (3.257) face and *respiratory interface* (3.202) with a specific make, model and size of a *respiratory protective device* (3.203)

3.92
flow rate
V_{fl}
volume (mass) of *breathable gas* (3.29) passing through the device in a given time

3.93
fogging
reduction of the *field of vision* (3.85) and/or visual acuity caused by the condensation of humidity on the *visor* (3.252)

3.94
force-fitting
practice of repeating a failed *fit test* (3.91) with the same *respiratory protective device (RPD)* (3.203) more than three times, re-donning, or otherwise adjusting the RPD (e.g. over-tightening the straps), until a passing fit test is finally achieved

3.95
fresh air hose breathing apparatus
respiratory protective device (3.203) in which *breathable air* (3.28) is obtained through an *air supply hose* (3.9) either assisted or unassisted

3.96
full face mask
tight-fitting respiratory interface (3.241) covering the mouth, nose, eyes and chin

3.97
gas
fluid that is in a gaseous state at a standard temperature and pressure that expands to occupy the space or enclosure in which it is confined

3.98
gas filter
filter (3.86) intended to remove specific *gases* (3.97) and *vapours* (3.251) from the atmosphere passing through it