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Respiratory protective devices - Recommendations for selection, use, care and maintenance - Guidance document

Appareils de protection respiratoire - Recommandations pour le choix, l'utilisation, l'entretien et la maintenance - Guide

Atemschutzgeräte - Empfehlungen für Auswahl, Einsatz, Pflege und Instandhaltung - Leitfaden

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Contents

Foreword

This European Standard (EN 529:2005) 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of an identical text or by endorsement, at the latest by March 2006, and conflicting national standards shall be withdrawn at the latest by March 2006.

This European Standard supersedes CR 529:1993.

Users of this European Standard, prepared in the field of application of Article 118A of the EC Treaty, should be aware that European Standards have no formal legal relationship with Directives which may have been made under Article 118A of the Treaty. In addition, national legislation in the Member States may contain more stringent requirements than the minimum requirements of a Directive based on Article 118A. Information on the relationship between the national legislation implementing Directives based on Article 118A and this European Standard may be given in a national foreword of the national standard implementing this European Standard.

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Introduction

Hazardous substances such as dusts, fibres, fumes, vapours, gases, micro-organisms and radioactive particulates and gases encountered at work can cause significant damage to health or, in extreme cases, can lead to death. This frequently occurs by the inhalation of harmful levels of hazardous substances that are present in the workplace air. Besides the inhalation exposure dermal exposure to hazardous substances can also lead to local skin damage, and sensitisation, as well as systemic effects.

Similarly exposure to an oxygen deficient atmosphere can lead to death.

Exposure (via all routes - inhalation, dermal and ingestion) to hazardous substances at work should be eliminated or alternative substances which are less hazardous used. Where elimination is not practicable adequate protective measures should be put in place so that exposures are reduced to a minimum.

The use of suitable protective measures at source should be the first choice for minimising the exposure. Such measures protect everyone in the workplace, whereas a respiratory protective device only protects the person who wears it. If adequate protective measures at source or any other administrative measures are not reasonably practicable or found to be inadequate for controlling inhalation exposure then an adequate and suitable respiratory protective device should be used.

Respiratory protective devices are designed to be worn in hazardous environments and should provide wearers with an adequate supply of breathable air or gas. Respiratory protective devices are considered to be at the bottom of the hierarchy of protective measures and should only be used after an acceptable case for their use has been established by way of an appropriate risk assessment.

Fatalities and serious accidents can occur if there is a failure to select and use a respiratory protective device suited to the substances, the wearer, the task and the environment in which the device is used. The failure to maintain the device in good working condition can also lead to similar consequences. These problems should be avoided by implementing a suitably designed respiratory protective device programme.

1 Scope

This European Standard provides guidance on the best practice for establishing and implementing a suitable respiratory protective device programme. It is published to provide a Europe-wide baseline for the selection, use, care and maintenance of respiratory protective devices. It provides guidelines for preparing national guidance in this area. The guidance contained in this European Standard is not intended to be exhaustive, but highlights important aspects to which attention should be given. The recommendations in this European Standard will help to comply with national legislation on this subject where it exists, or with European legislation.

Respiratory protective devices used exclusively in diving and at increased or reduced atmospheric pressures are not covered by this guidance.

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*

3 Terms and definitions

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

3.1
atmosphere immediately dangerous to life or health
atmosphere in which the concentrations of hazardous substances, including asphyxiants, or the oxygen levels present create one or more of the following conditions:

— immediate threat to life;

— could cause delayed threat to life;

— would cause immediate acute health effects;

— would prevent the respiratory protective device wearer from an unaided escape to safety in case of the device malfunctioning or failing to operate correctly

3.2
assigned protection factor (APF)
level of respiratory protection that can realistically be expected to be achieved in the workplace by 95 % of adequately trained and supervised wearers using a properly functioning and correctly fitted respiratory protective device and is based on the 5^{th} percentile of the Workplace Protection Factor (WPF) data

3.3
breathing zone
space outside the facepiece extending 0,3 m in radius in front of the respiratory protective device wearer's face and centred on the mid-point of a line joining the ears

3.4
competent person
person with suitable and sufficient experience and with practical and theoretical knowledge of the elements of respiratory protective device programme for which that person is responsible

3.5
emergency breathing facility
facility, as specified by the respiratory protective device manufacturer, coming into operation when the normally operating respiratory protective device is not functioning. The facility provides an adequate level of protection for a period to enable the device wearer to exit the work area, unassisted, to a place of safety

3.6
nominal protection factor
number derived from the maximum percentage of total inward leakage permitted in relevant European Standards for a given class of respiratory protective device. The relationship between nominal protection factor and total inward leakage can be expressed as follows:

$$\text{nominal protection factor} = \frac{100}{\text{permitted maximum percentage total inward leakage}}$$

3.7
maximum allowed occupational exposure limit
limit of the time weighted average concentration of hazardous substances in the air within the breathing zone of a worker in relationship to a specified reference period

3.8
specified reference period
specified time for the purposes of time-weighting the exposure concentration as stated for the occupational exposure limit value of hazardous substances. The specified reference period for the long-term limit value is normally 8 h and for the short-term limit value is normally 15 min

3.9
peak inhalation rate
maximum instantaneous volume flow rate which occurs during an inhalation cycle of a respiratory protective device wearer

3.10
respiratory protective device passport
document for recording the details of initial and refresher training provided to a respiratory protective device wearer

3.11
workplace protection factor
ratio between the breathing zone (see 3.3) concentration (outside the facepiece) of a chosen hazardous substance and its concentration inside the facepiece (suitable sampler being placed as near as possible to the mouth of respiratory protective device wearer) of a correctly functioning respiratory protective device when correctly worn and used in the work place. The workplace protection factor may be expressed as:

$$\text{workplace protection factor} = \frac{\text{concentration within the breathing zone (outside the facepiece)}}{\text{concentration inside the facepiece}}$$

3.12
work rate
physiological load (strain) imposed on an individual respiratory protective device wearer due to his work rate can be defined in terms of the maximal oxygen uptake rate in l/min. The rate of oxygen uptake due to work rate can be categorised into light, moderate, heavy and very heavy metabolic rates (watts)

NOTE Metabolic rate may be calculated using the international standard method (see EN ISO 8996).

4 Classification

4.1 General classification

There are two distinct types of respiratory protective devices:

a) Filtering devices: These purify the ambient air to be breathed using filters able to remove contaminants in the air.

b) Breathing apparatus: These supply the wearer with breathable air (e.g. compressed air), or breathable gas, (e.g. compressed oxygen) from an uncontaminated source.

Details of different types of devices are given in Annex A.

4.2 Main components

4.2.1 General

A respiratory protective device consists of two main components, a facepiece and filter(s) or a facepiece and a means of supplying uncontaminated breathable air or gas.

4.2.2 Facepieces

The facepiece directs the uncontaminated breathable air or gas to the wearer's nose and mouth area. Filtering devices and breathing apparatus are available with a range of different facepieces but there are some important limitations.

— Tight-fitting facepieces (filtering facepieces, quarter masks, half masks and full face masks) rely heavily on a good seal between the mask and the wearer's face. Full face masks, half masks and quarter masks may be used for both types of devices as described in 4.1.

— Loose-fitting facepieces (e.g. hoods, helmets, visors, blouses, suits) rely on enough air being provided to prevent contaminants leaking into the facepiece as the wearer breathes and moves about. They are only used on powered filtering devices or with suitable breathing apparatus. In other words, loose-fitting facepieces are not suitable for devices which rely on the breathing action of the wearer to draw air. These include unpowered filtering devices and some breathing apparatus.

— Mouthpieces are used with certain devices. They make any form of verbal communication impossible. They are used in conjunction with a nose clip.

4.2.3 Filters

Filtering devices should have the correct type of filter(s) matched to the substance(s) from which the wearer needs protection. The filters can only protect against limited concentration ranges of contaminants as specified by the manufacturers. The filter can be for protection against particles (particle filters), gases/vapours (gas filters) and for protection against particles and gases/vapours (combined filters). Further details are given in A.2.

4.2.4 Breathable air or gas supply source for breathing apparatus

A source (e.g. chemical oxygen generator or compressed air line) or a vessel (e.g. a gas cylinder) which is capable of supplying uncontaminated breathable air or gas to a breathing apparatus. The quality of the compressed air for breathing apparatus should be in accordance with EN 12021. Further details are given in A.4.5.