PD ISO/TS 16975-2:2016

BSI Standards Publication

Respiratory protective devices — Selection, use and maintenance

Part 2: Condensed guidance to establishing and implementing a respiratory protective device programme

bsi.

National foreword

This Published Document is the UK implementation of ISO/TS 16975-2:2016.

This International technical specification introduces the concept of ISO Protection levels (PLs). The ISO PLs represent the degree of respiratory protection that is expected to be provided to wearers by a class of respiratory protective devices (RPD) when used within an effective RPD programme.

The proposed ISO PLs have been derived from professional judgement based on previous assigned protection factors (APF), their associated nominal protection factors (NPF) and knowledge of differences between laboratory and workplace protection performance of current products.

However, until the proposed ISO PLs have been validated, (when RPD conforming to the requirements of the performance standards are available) they are provided for information only. In the interim period, the assigned protection factors as published by the UK Health and Safety Executive (HSE) in guidance document HSG53 *Respiratory protective equipment at work- A practical guide* (HSE, 2013) should be used.

Further information on the selection of suitable and adequate RPE can be found on the HSE website at http://www.hse.gov.uk/respiratory-protective-equipment

Subclause 7.6.4 of this technical specification states that where national or local regulations exist for the breathable gas quality, then these shall be met. Attention is drawn to BS EN 12021 *Respiratory equipment - Compressed gases for breathing apparatus* as a reference standard for breathable gas quality.

The UK participation in its preparation was entrusted to Technical Committee PH/4, Respiratory protection.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2017

ISBN 978 0 580 90021 1
ICS 13.340.30

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 March 2017.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TS 16975-2:2016

TECHNICAL SPECIFICATION

ISO/TS 16975-2

First edition
2016-06-15

Respiratory protective devices — Selection, use and maintenance —

Part 2: Condensed guidance to establishing and implementing a respiratory protective device programme

Appareils de protection respiratoire — Choix, utilisation et entretien —

Partie 2: Directives condensées pour établir et améliorer un programme de dispositif de protection respiratoire

Reference number
ISO/TS 16975-2:2016(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 15, *Respiratory protective devices*.

ISO 16975 consists of the following parts, under the general title *Respiratory protective devices — Selection, use and maintenance*:

— *Part 1*: *Establishing and implementing a respiratory protective device programme* [Technical Specification]

— *Part 2*: *Condensed guide to establishing and implementing a respiratory protective device programme* [Technical Specification]

— *Part 3*: *Fit testing procedures*

Introduction

Respiratory protective devices (RPD) should only be used after all practicable control measures have been taken or while they are being implemented, and the risk assessment indicates the presence or potential presence of a hazardous atmosphere.

When RPD is required to control exposure, then the RPD needs to be correctly selected, used and maintained.

This Technical Specification provides a condensed guide for establishing and implementing a complete respiratory protective device programme for RPD that meet the requirements of the performance standards. It is designed for employers especially in small and medium sized enterprises.

This Technical Specification provides basic information on risk assessment, selection procedure, training, use and maintenance. Assistance from the RPD supplier/manufacturer or health and safety professional to establish and implement the programme may be required.

It provides guidance on how to do this together with a table to assist in the selection process. It follows a simple step-by-step approach to deciding the minimum level of protection required from the RPD and the most suited to the wearers, the task and workplace conditions.

It is the responsibility of the employer, to correctly select adequate and suitable RPD based on a risk assessment.

Respiratory protective devices — Selection, use and maintenance —

Part 2: Condensed guidance to establishing and implementing a respiratory protective device programme

1 Scope

This Technical Specification provides brief guidance to assist persons responsible for establishing and implementing a programme for respiratory protective devices (RPD) that meet the performance requirements. There are special applications where the selection of suitable RPD using this guide is not appropriate. These are:

a) Fire Fighting – structural and wildland firefighting, hazardous materials and rescue applications;

b) CBRN (Chemical, Biological, Radiological and Nuclear agents);

c) Marine – shipboard or off-shore firefighting or hazardous materials applications;

d) Mining – underground mining or firefighting and rescue applications; and

e) Escape – general, fire, CBRN, marine and mining.

NOTE 1 For more detailed information relating to the special applications, refer to ISO/TS 16975-1.

This guidance does not apply to selecting RPD against bio aerosols.

NOTE 2 Reference [3] addresses selection of RPD for bio aerosols that are capable of causing infection or adverse or allergic response but for which no occupational exposure limits have been established.

This guidance does not apply to RPD programmes for RPD used exclusively under water, in aircraft, and medical life support respirators and resuscitators.

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.

ISO 16972, *Respiratory protective devices — Terms, definitions, graphical symbols and units of measurement*

ISO/TS 16975-1, *Respiratory protective devices — Selection use and maintenance — Part 1: Establishing and implementing a respiratory protective device programme*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16972 and ISO/TS 16975-1 apply.

4 Basic information

4.1 General

RPD should only be used after all other reasonably practicable control measures have been taken.

4.2 Risk assessment

To select adequate and suitable RPD, first, complete a risk assessment which considers the hazardous substance(s) being used or generated, the possible lack of oxygen, the task(s) being undertaken and the person performing the task(s) (i.e. the wearer). Information on hazardous substance(s), such as occupational exposure limits (OEL) can be found in their safety data sheets (SDS) or material safety data sheets (MSDS) or other published documentation. Information on process generated substances, if applicable, shall be followed. Such information may be available in substance-specific regulations or guidance (e.g. for asbestos).

Existing regulations that direct to a specific type and class of RPD shall be followed, e.g. asbestos.

Once the risk assessment is completed and the required information gathered, the RPD selection process and record (Annex A) can be used.

Depending upon the workplace circumstances and the information gathered for the risk assessment, the output of the RPD Selection Record may be either the classification of suitable RPD, or sufficient information to enable the RPD supplier to recommend suitable RPD.

NOTE Further information on RPD classification is given in ISO/TS 16973[1].

The record of RPD selection should be retained.

Where the RPD selection record recommends seeking professional advice, RPD manufacturers/suppliers and safety and health consultants are good sources of information.

4.3 Use of assigned protection factors (APF) and ISO protection levels (PL)

National or local regulations may require that RPD be selected using APF. Where this is the case, the adequacy assessment (Annex A, Step 4) provides a method for using APF.

This part of ISO/TS 16975 provides an option of using either the nationally accepted assigned protection factors (APF) or ISO protection levels (PL).

However, it should be noted that APF relate to specific design types and classes of RPD and that these will be different to the ISO RPD classifications. RPD complying with the performance standards of the same basic design may have different laboratory performance and may therefore fall into a different protection class (PC).

Where nationally accepted APF are to be used, select RPD having an APF greater than the hazard ratio (HR) calculated in Annex A, Step 3. The PL is used in the selection process in the same manner as APF.

IMPORTANT — The proposed ISO protection levels that are proposed, have been derived from professional judgement based on previous assigned protection factors, their associated nominal protection factors (NPF) and expert knowledge of differences between laboratory and workplace protection performance of current products. The values will be validated when RPD conforming to the requirements of the performance standards are available and, until then, are for information only. In the interim period, APF's should be used, if available. Where PLs are used prior to their validation, it is the responsibility of the RPD programme administrator to determine the suitability of the PL values.

4.4 Types and classes of RPD

4.4.1 Types of RPD

There are two types of respiratory protective devices: filtering RPD and supplied breathable gas RPD.

a) Filtering RPD

Filtering RPD remove (by e.g. filtration, adsorption, or chemical reaction) hazardous substances present in the ambient air before being inhaled by the wearer. The air is drawn through the filter(s) either by the wearer's inhalation action or with the assistance of a blower unit.

b) Supplied breathable gas RPD

Supplied breathable gas RPD supply the wearer with breathable gas from a source independent of the ambient atmosphere either individually carried (self-contained) or from a remote source.

4.4.2 Classes of RPD

All RPD are classified by protection class (PC1 to PC6), the work rate class (W1 to W4) and the respiratory interface class. Additionally, filtering RPD are classified by the type and class of filters and supplied breathable gas RPD are classified by breathing gas capacity.

RPD are available with a range of respiratory interfaces. They are categorized by areas of coverage of the wearer's body and by fitting characteristics. These are mouth only, mouth and nose, face, head and body. Respiratory interfaces can be tight fitting (type T), those that have a complete seal with the skin, or loose fitting (type L), those that do not have a complete seal to the wearer's skin.

Examples of various respiratory interfaces and type of RPD are given in ISO/TS 16975-1.

5 RPD programme elements

The RPD programme elements are specified in Table 1.

Table 1 — RPD programme elements

Programme elements	Actions	Relevant clauses
Risk assessment	Carry out a risk assessment Apply control measures if required Establish the need for RPD	4.2
Environment	Consider the requirements of the workplace environment, the task(s) and the wearer(s)	6.2 and 6.3
Hazardous substances	Measure or estimate its concentration and its form in the air – particulate, gas, vapour Consider the potential for oxygen-deficiency	6.4
Protection class	Identify the minimum protection level required	6.5
Selection	Use the information gathered in the assessment to select the appropriate RPD	6.6 to 6.10
Fit testing	Ensure tight-fitting RPD (Class T) are fit tested	6.11
Training of the RPD wearer	Provide training in the use, checking and maintenance of the RPD	Clause 7
Implementation	Include a filter change routine, battery charging, cleaning, breathable gas quality checking as appropriate	Clause 8
Management	Include regular supervision and regular reminders to wearers	Clause 9, 9 a

Table 1 *(continued)*

Programme elements	Actions	Relevant clauses
Maintenance	Maintain reusable RPD Replace parts as recommended by the manufacturer. Correct any faults promptly	9 b
Review	Review at suitable intervals to ensure that any change in conditions, hazardous substance, wearers, etc. are adequately addressed	9 c
Records	Keep records of the RPD programme	Clause 10

6 Selection procedure

6.1 General

Follow the steps below and complete the RPD selection process and record as given in Annex A. Information from the hazards assessment concerning the hazardous substances, the working environment including the potential for oxygen-deficiency, the task and the wearer(s) is required.

Where the table in Annex A recommends seeking professional advice RPD manufacturers/suppliers and safety consultants are a good source of information.

6.2 Step 1: Organization information

Fill in the details of the organization and location of where the task is to be undertaken, and the details and job title of the person completing the selection procedure.

6.3 Step 2: Description of the task

Describe the task and the environment in which the task will be conducted.

NOTE Not all RPD are suitable for wearing for long periods of time or suitable for cold or hot environments, etc.

6.4 Step 3: Define the hazards

The contaminant(s) should be identified by chemical name or Chemical Abstract Number (CAS number) and its airborne concentration(s) measured or estimated. The potential for oxygen deficiency in the working area shall be considered.

The information on the occupational exposure limits (OEL) and the immediately dangerous to life or health (IDLH) concentrations (if applicable) can be found by reference to SDS or existing national regulations, publications or guidance.

For each of the contaminants, enter in the RPD selection process and record (see Annex A):

a) the concentration in Column A;

b) the IDLH level in Column B;

c) the OEL in Column C;

d) the calculated hazard ratio in Column D;

e) the highest hazard ratio in Column E.

If the contaminant is not known and/or the concentration not known or it is uncertain whether there is the potential for oxygen-deficiency then seek professional advice or follow national, local or industry guidance.

When multiple contaminants are present that have additive health effects, the HR should be calculated for the mixture using the mixture formula (see ISO/TS 16975-1). This result is the required PL.

When multiple contaminants are present that do not have additive health effects, the HR should be calculated for each contaminant and the highest HR should be used to determine the required PL.

6.5 Step 4: Determination of the protection class

When national regulations specify the use of APF, select the APF which is greater than the highest hazard ratio calculated.

When no national regulations are specified, the use of ISO protection levels (PL) is recommended. Determine the PC required by comparing the highest hazard ratio calculated in Step 3 with the PL listed.

6.6 Step 5: Work rate assessment

In order to select RPD that is suitable for the work rate at which the wearer will be working during the task, compare the task demands with the descriptions in the table for W1, W2, W3 and W4.

a) If the task only requires light to moderate manual work, then select W1, e.g. light manual work to sustained hand and arm work.

b) If the task requires heavy to very heavy work, then select W2, e.g. intense arm and trunk work to intensive shovelling or digging.

c) If the task requires very, very heavy to extremely heavy manual work, then select W3, e.g. walking quickly or running with protective equipment and/or heavy tools and goods to crawling under and climbing over obstacles.

d) If the task requires maximal work, then select W4, e.g. climbing stairs and ladders at high speed.

6.7 Step 6: Filter identification

If filtering RPD is selected, then the correct type and class of filter shall be used. Selecting the correct filter type and class requires knowledge of the task, the hazard and the work rate. Using this information seek professional advice to identify the correct filter.

6.8 Step 7: Supplied breathable gas RPD capacity

Supplied breathable gas RPD of class Sxxxx usually includes a cylinder(s) of compressed breathable gas. These cylinders are available in various volumes and working pressures leading to a number of usable durations. Calculate the minimum volume in litres required to ensure that the capacity of the RPD is adequate for the task duration and work rate.

If the calculated capacity is greater than any available class Sxxxx RPD capacity then either redesign the work task to allow available class Sxxxx RPD to be used, or use RPD of class SY if suitable (see 6.11).

6.9 Step 8: Task related factors

The RPD selected shall be suitable for the task that the wearer will be undertaking while wearing the RPD. Certain task requirements may restrict the range of suitable RPD. This step asks a number of questions relating to the task and gives advice as to the most suitable types of RPD.

6.10 Step 9: Wearer related factors

The RPD selected shall be suitable for the wearer. Some wearer-related factors such as hair, the need to wear corrective lenses and medical conditions might restrict the range of suitable RPD. This step asks a number of questions relating to the wearer and gives advice as to the most suitable types of RPD.

Fit of RPD: As people come in different shapes and sizes, facial differences will mean one model and size of respiratory interface is unlikely to fit all wearers. It is essential that where an RPD includes a tight fitting respiratory interface then the wearer should be fit tested to ensure that the selected RPD is capable of fitting them.

Hair: Any beard, stubble, thick sideburns, moustache or any other hair where a respiratory interface is intended to seal against the skin or which may interfere with the function of the RPD, will most likely cause leakage. In such cases, select a loose-fitting respiratory interface.

Spectacles: The use of corrective spectacles can interfere with the protection offered by many types of RPD. Where corrective spectacles are required, they should be of a design which is compatible with the RPD. Spectacles may be available (as an accessory from the RPD manufacturer) which fit completely inside the respiratory interface without breaking the face seal. Alternatively, a RPD which allows use of the corrective spectacles can be selected, e.g. loose fitting RPDs. Advice on this aspect should be sought from the respiratory protective device manufacturer.

Contact lenses: Contact lenses may be used where the wearer has successfully worn contact lenses before and practices wearing them with a RPD, however, the use of contact lenses can cause problems in certain cases. These can include excessive drying of the eyes from the airflow of the RPD or lenses becoming dislodged during use. In both cases, there can be a temptation for the wearer to remove the RPD to correct the problem causing exposure to contaminant. An assessment should therefore be made as to whether the wearer can easily move to a clean area and remove the RPD to attend to the lenses. If this cannot be achieved quickly and without spreading contamination, the use of contact lenses should be discouraged.

Compatibility with other PPE: It is essential that different items of PPE including RPD do not interfere with each other during use, preventing one or more of the devices from working correctly.

6.11 Step 10: Final selection

Using the information gathered in Step 1 to Step 9 and the advice given relating to task and wearer related factors, select the minimum class of RPD suitable.

Using the minimum classification and the other information gathered, identify suitable RPD in discussion with RPD wearers and employee representatives, RPD manufacturer/supplier and relevant authorities if and when required.

Select a specific RPD from the suitable RPD identified. If a tight-fitting RPD is selected, perform fit testing.

The selection may have to be changed depending on the result of a fit test. Many things can interfere with the fit of a tight fitting RPD and can seriously affect its performance. These include, but are not limited to:

a) facial hair, sideburns, or long hair coming into contact with the face seal area of a respiratory interface;

b) deep cuts or scars, heavy wrinkles, moles, warts, facial jewellery and piercings, etc.;

c) other types of PPE such as spectacles and goggles.

Therefore, all potential wearers of tight-fitting respiratory interfaces should be fit tested prior to being allowed to wear the selected RPD in the workplace.

NOTE Further information on fit testing is given in ISO 16975-3[2].

In some situations, both filtering and supplied breathable gas RPD may be suitable. Table 2 provides additional guidance that will assist in deciding between filtering or supplied breathable gas RPD.

Table 2 — Additional guidance to assist in deciding between filtering or supplied breathable gas RPD

Filtering RPD	Supplied breathable gas RPD	
	Class Sxxxx	Class SY
— Suitable filters might not be available for the identified contaminant(s) — Filters have limited capacity and have to be changed periodically — A filter change schedule shall be established to suit the task and work environment	— Requires an external supply of high pressure breathable gas for refilling cylinders — There will be a time duration restriction due to the capacity of the breathable gas — Requires gas of breathable quality — Requires regular breathable gas quality measurements	— Mobility might be restricted due to supply hoses — Requires an external supply of medium pressure breathable gas — Requires gas of breathable quality — Requires regular breathable gas quality measurements

7 Training of the RPD wearer

Every RPD wearer should be trained in correct use, storage and where necessary maintenance in accordance with the manufacturer's instructions.

Training should include:

a) the contents of the manufacturer's instructions for use;

b) the reasons for wearing RPD;

c) which RPD should be used;

d) how to check the right RPD is provided;

e) when to wear the RPD;

f) how to inspect the RPD before use;

g) when to change the filters, or replenish breathable gas cylinders;

h) what types of user maintenance should be carried out and how;

i) how to clean and disinfect the RPD after use;

j) what to do in an emergency;

k) what to do if the RPD is damaged or not working properly

l) how to store the RPD;

m) how to dispose of the RPD and its components.

8 Using RPD

8.1 General

RPD shall be inspected, used, maintained and stored as described in the user instructions supplied by the RPD manufacturer and in accordance with local or national regulations.

It is essential that:

a) the RPD is clean, not damaged and is in good working order before putting it on, even when new;

b) the RPD is worn all the time when in the contaminated area;

c) if filters are used, a filter replacement schedule should be put in place;

d) wearers of tight fitting respiratory interfaces are clean-shaven in the area of the RPD seal;

e) wearer seal-checks are performed each time tight fitting respiratory interfaces are used;

f) the RPD wearers leave the contaminated area immediately if they smell, taste or sense irritation or the RPD becomes damaged;

g) the RPD wearers leave the contaminated area immediately if a warning alarm on the RPD operates;

h) filtering RPD are never used in oxygen-deficient or IDLH atmospheres;

i) type SY without escape facility not to be used in IDLH atmosphere.

8.2 Using Filtering RPD

A filtering RPD will not provide protection unless it is equipped with the correct type of filter for the hazardous substances.

8.3 Replacing filters

It is essential that:

a) filters are replaced according to the manufacturer's instructions;

b) filters may have to be changed more often than just at the end of the shift;

c) filters marked for single shift use only are taken out of service after the shift or at the end of the work day, and not reused;

d) filters are replaced with the same type and class, in a non-contaminated environment;

e) a replacement schedule is established to meet the relevant work situation by getting help from the filter supplier;

f) particle filter(s) are replaced before breathing becomes more difficult;

g) filters are replaced if damaged; and

h) gas filters are replaced as directed by the end-of-service-life-indicator (if present).

8.4 Using supplied breathable gas RPD

It should be ensured that

a) the breathable gas supplied is of a quality required by national or local regulations. If no regulations exist, seek professional advice, and

b) the supply of breathable gas is sufficient volume and pressure for the intended duration of the given task and for all wearers. The source of breathable gas may be limited e.g. from a compressed air cylinder.

9 Management of the RPD programme

It is essential that the selection, use and maintenance of RPD is correctly managed to ensure that the RPD will continue to provide the protection required:

a) RPD wearers should be supervised to ensure they are using the RPD in accordance to manufacturer's instruction and training provided;

b) RPD should be maintained and stored in accordance with the information supplied by the RPD manufacturer;

c) The RPD programme should be reassessed at suitable intervals to ensure that any changes in conditions, hazardous substance, wearers, etc. are adequately addressed.

10 Records

The following records are to be kept for a time period appropriate to the toxicity and latency period of diseases associated with the contaminants concerned and at least for the minimum period required by any national or local regulations or standards:

a) risk assessment;

e) RPD selection process;

f) fit testing, if applicable;

g) wearer training;

h) RPD Maintenance and defects, if applicable;

i) checks on the quality of the breathable gas supply, if applicable;

j) programme review.

National or local regulations or standards can require additional records to be kept.

Annex A
(normative)

Respiratory protective device (RPD) selection process and record

The following form summarizes and records the risk assessment and selection of respiratory protective devices.

This form can be used as a record of RPD selection.

Step 1	**Organization information**
Organization:	**Location:**
Details of the person completing the form **Name:** **Job title:**	**Name of wearer(s)**

Step 2	**Description of the task**
Is the task any of the following? Firefighting, CBRN, marine, mining, escape, – Use the selection procedure in ISO/TS 16975-1 **If the task is not any of the above, describe the task and the working environment** (e.g. motor vehicle paint spraying inside a spray booth, kerb stone cutting outdoors, welding, abrasive blasting)	
(a) How long does the task take? **(e.g. spraying a motor vehicle – 20 min, sanding a wood panel – 10 min, cutting stone – 5 min)** **_____h ____min** **How many times a shift? _____times a shift**	**(b) What are the working conditions? (Include the range)** **Temperature: _____ °C** **Humidity: _____ %RH**

Step 3	**Define the hazards**	
Is the work area deficient in Oxygen or the potential to become oxygen deficient?	**Yes**	Follow national regulations if they exist. If there are no national regulations use the selection procedure in ISO/TS 16975-1
	No	**Continue to next question**
Is the contaminant known?	**Yes**	**Continue to next question**
	No	I. Seek professional advice to identify the contaminant, or refer to national regulations or industry guidance related to the task II. If the contaminant cannot be identified then select supplied breathable gas RPD with the highest Protection Class **Go to step 5**
Is the concentration of the contaminant known (i.e., by measurement or estimation)?	**Yes**	**Continue - complete the table below**
	No	I. Refer to national regulations or industry guidance to establish the required protection level **- Go to step 5,** or II. Refer to national regulations or industry guidance to establish the specific RPD type and classification **- Go to step 6,** or III. Refer to ISO/TS 16975-1 or seek professional advice to measure or estimate the concentration – **Continue – complete the table below,** or IV. Select supplied breathable gas RPD with the highest Protection class **- Go to step 5**

Complete the boxes below for particulate contaminants (dust, fibre, fume, smoke, mist, fog)				
Contaminant Name/CAS number (if applicable)	**(A) Concentration** Measured or estimated concentration in air [mg/m³ or fibres/ml]	**(B) IDLH Level (if applicable)** Immediately dangerous to life or health [mg/m³ or fibres/ml]	**(C) OEL** Occupational Exposure Limit value should be the same unit as in (A). If no OEL what is the safe exposure value?	**(D)** Calculate the Hazard ratio (*HR*) $HR = \frac{(A)}{(C)}$
(i)				
(ii)				
(iii)				
(iv)[a]				
Complete the boxes below for gas/vapour contaminants				
Contaminant Name/CAS number (if applicable)	**(A) Concentration** Measured or estimated concentration in air [ppm or mg/m³]	**(B) IDLH Level (if applicable)** Immediately dangerous to life or health [ppm or mg/m³]	**(C) OEL** Occupational Exposure Limit value should be the same unit as in (A). If no OEL what is the safe exposure value?	**(D)** Calculate the Hazard ratio (*HR*) $HR = \frac{(A)}{(C)}$
(i)				
(ii)				
(iii)				
(iv)[a]				
Result of step 3				
Which one of the contaminant(s) from the above tables (and separate sheet) has the highest Hazard Ratio in (D)? Record it in (E). If the hazard ratio is <1 then RPD is not required UNLESS national or local regulations apply to the contaminant				**(E) Highest hazard ratio:**

Are any of the contaminant concentrations in (A) higher than the IDLH value (B)? **(if applicable)**	**Yes**	Select supplied breathable gas RPD (When class SY RPD is selected it has to be combined with an escape class ES or class S RPD.)
	No	**Continue to step 4**

[a] If more than four contaminants are present continue on a separate sheet.

Step 4	**Determination of the Protection Class**					
a) Do national regulations specify the type of RPD?	Yes	**Follow the regulations**				
	No	**Continue 4 b).**				
b) Do national regulations specify the use of APFs?	Yes	**Choose a RPD with an APF that is greater than the HR**				
	No	**Continue 4 c)**				
c) Circle the number to the right that is greater than the Hazard Ratio as given in (E)	4	10	30	250	2 000	10 000
d) choose the PC below the circled number and record in the lower right box *	PC1	PC 2	PC 3	PC 4	PC 5	PC 6
Minimum Protection Class required	**PC***					

Step 5		**Work rate assessment**	
There are four work rate classes - W1, W2, W3 and W4. **Choose the work rate class that best matches the task to be undertaken.**	**W1**	From light manual work to sustained hand and arm work such as bench work, standing, drilling	Select RPD with at least work rate class W1
	W2	From Intense arm and trunk work to intensive shovelling or digging	Select RPD with at least work rate class W2
	W3	From walking quickly or running with protective equipment and/or heavy tools and goods to crawling under and climbing over obstacles. Work that cannot be sustained for more than 15 minutes.	Select RPD with at least work rate class W3
	W4	Climbing stairs and ladders at high speed. Work that cannot be sustained for more than 5 minutes.	Select RPD with at least work rate class W4
		Minimum Work rate class required	**W**

Step 6		**Filter Identification**	
Using the information in Step 2 (a & b),Step 4 and Step 5, seek professional advice to identify the type and class of filter(s) suitable for the hazard including their relevant service life(s) applicable to your task. **Alternatively if you wish to use a supplied breathable gas RPD, go to Step 7.**			
Has a suitable filter been identified?	**Yes**	**Filter type & class:**	**Recommendation received from:**
		Go to Step 8	
	No	Select supplied breathable gas RPD **Go to Step 7**	

Step 7	**Supplied Breathable Gas RPD capacity**
Calculate the volume of the breathable gas needed for the duration of the task, including entry and exit, by using the information in Step 3 and Step 5, using the calculations below. **Changing the work rate will change the useable duration of the breathable gas volume**	
Calculation	**Minimum capacity**
Duration of task (min) × 30 L/min for W1 (e.g. 20 min × 30 L/min = 600 L)	Litres (L)
Duration of task (min) × 40 L/min for W2	
Duration of task (min) × 50 L/min for W3	
Duration of task (min) × 65 L/min for W4	
Classification options for class S RPD: The minimum classification necessary in litres is the calculated capacity, rounded up in increments of 150 L, if less than 900 L, and in increments of 300 L if above 900 L. If the calculated capacity for the task duration is greater than any available class Sxxxx RPD capacity then use class SY RPD.	
Minimum class S	**S**

Step 8		**Task related Factors**
Answer all of the following questions for each wearer (circle Yes / No)		
Is the task carried out in a confined space? (e.g. vat, pit, chambers, tanks, trenches, pipes, sewers, flues or wells)	**Yes**	Requires special considerations in accordance with national regulations. Seek professional advice
	No	**Continue**
Is the duration of RPD continuous wear >1 hour before it is taken off**?**	**Yes**	Consider assisted filtering RPD or supplied breathable gas RPD or seek guidance from national or local regulations
	No	**Continue**
Is the contaminant an eye irritant**?**	**Yes**	Consider selecting RPD which covers the entire face or head (respiratory interfaces class c, d or e)
	No	**Continue**
Does the task require mobility such that the use of air supply hoses is impractical?	**Yes**	Do not select type SY RPD
	No	**Continue**

Is precise communication needed to give safety critical instructions when RPD is worn?	**Yes**	Select RPD that are fitted with a speech diaphragm or additional communication means
	No	**Continue**
Does the task create sparks, molten metals or UV radiation?	**Yes**	Seek RPD manufacturer/supplier advice as specialised RPD may be required
	No	**Continue**
Is the work area atmosphere potentially explosive or flammable?	**Yes**	Seek RPD manufacturer/supplier advice as specialised RPD, e.g.intrinsically safe RPD, may be required
	No	**Continue**
Is the work area atmosphere corrosive?	**Yes**	Seek RPD manufacturer/supplier advice as specialised RPD may be required
	No	**Continue**

Step 9	**Wearer related Factors**	
Answer the following questions for each wearer (circle Yes / No)		
Are any of these present in the sealing area of the respiratory interface – stubble, beards, moustache, side burns, deep facial marking or facial jewellery?	**Yes**	Select loose fitting RPD (class L). Continue
	No	**Continue**
Are corrective lenses worn?	**Yes**	Select RPD that do not interfere with the corrective lenses or RPD that have facilities for wearing corrective lenses Continue
	No	**Continue**
Are other types of personal protective equipment (PPE) worn (e.g. head, eye and hearing protection, protective clothing etc),	**Yes**	Ensure that the selected RPD and other PPE required for the task do not interfere with each other. Consider RPD that provide integrated head and/or face and eye and hearing protection. Continue
	No	**Continue**
Has the potential wearer been medically cleared to wear a RPD?	**Yes**	**Continue**
	No	**See note below - seek professional advice**
Medical conditions:: Some pre-existing medical conditions (examples include breathing disorders such as asthma, or skin allergies or heart problems) may restrict or prevent some workers wearing any RPD or certain types of RPD. Ensure that workers are medically able to wear the selected and required RPD. Seek medical advice. Where national or local regulations exist these should be followed.		

Step 10	**Final Selection**			
Minimum class of Filtering RPD Fill in the boxes below with the information gathered				
Protection class required (See Step 4)	**Work rate class required** (See Step 5)	**Filter type and class required** (See Step 6)	**Suitable Respiratory Interface**	**Suitable RPD** Identify examples of suitable RPD
PC	**W**			
Minimum Class of Supplied breathable gas RPD Fill in the boxes below with the information gathered				
Protection class required (See Step 4)	**Work rate class required** (See Step 5)	**Breathable Gas capacity** (Sxxxx or SY) (See Step 7)	**Suitable Respiratory Interface**	**Suitable RPD** Identify examples of suitable RPD
PC	**W**	**S**		

Choose a RPD from the list of suitable RPD meeting the above requirements. If no such option is currently available on the market, select the next higher class and record. If the selected RPD has a tight fitting Respiratory Interface, conduct a fit test on the wearer using that RPD.
Selected RPD:
Employer statement I understand that It is ultimately the responsibility of the employer, to select adequate and suitable RPD based on a risk assessment, to ensure that fit testing has been carried out with the RPD selected, where applicable, and that each wearer has been trained and is medically cleared. Name of the person providing the information in this form: _____ Signature:_____ Date:_____ Company Name: _____

Bibliography

[1] ISO/TS 16973, *Respiratory protective devices — Classification for respiratory protective device (RPF), excluding RPD for underwater application*

[2] ISO/TS 16975-3[1)], *Respiratory protective devices — Selection, use and maintenance — Fit testing procedures*

[3] Canadian Standards Association. (CSA 2011) Selection, use and care of respirators, CSA Z94.4-11, Canadian Standards Association, Ontario, Canada

1) To be published.

This page deliberately left blank

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Copyright in BSI publications

All the content in BSI publications, including British Standards, is the property of and copyrighted by BSI or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use.

Save for the provisions below, you may not transfer, share or disseminate any portion of the standard to any other person. You may not adapt, distribute, commercially exploit, or publicly display the standard or any portion thereof in any manner whatsoever without BSI's prior written consent.

Storing and using standards

Standards purchased in soft copy format:

- A British Standard purchased in soft copy format is licensed to a sole named user for personal or internal company use only.
- The standard may be stored on more than 1 device provided that it is accessible by the sole named user only and that only 1 copy is accessed at any one time.
- A single paper copy may be printed for personal or internal company use only.

Standards purchased in hard copy format:

- A British Standard purchased in hard copy format is for personal or internal company use only.
- It may not be further reproduced – in any format – to create an additional copy. This includes scanning of the document.

If you need more than 1 copy of the document, or if you wish to share the document on an internal network, you can save money by choosing a subscription product (see 'Subscriptions').

Reproducing extracts

For permission to reproduce content from BSI publications contact the BSI Copyright & Licensing team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email subscriptions@bsigroup.com.

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Useful Contacts

Customer Services
Tel: +44 345 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 345 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

bsi.