

First edition
2021-01

Respiratory protective devices — Performance requirements —

Part 2: Requirements for filtering RPD

*Appareils de protection respiratoire — Exigences de performances —
Partie 2: Dispositifs de filtration*



Reference number
ISO 17420-2:2021(E)

© ISO 2021



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of ISO 17420-2:2021. [Click here to purchase the full version from the ANSI store.](#)

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions, abbreviations and symbols	2
3.1 Terms and definitions	2
3.2 Abbreviated terms	3
3.3 Symbols	4
4 Classification overview	5
5 General requirements for RPD	6
5.1 General	6
5.2 Field of vision	6
5.3 Resistance to flame – Single burner dynamic	6
5.4 Compatibility with additional equipment	6
5.5 Monitor performance	6
5.6 Warning device(s), checking device(s) and control means	6
5.6.1 Performance of warning device(s), if applicable	6
5.6.2 Performance of checking device	7
5.6.3 Control means (if applicable)	7
5.7 Protection class determination	7
5.7.1 General	7
5.7.2 Total inward leakage (TIL)	7
5.7.3 Total inward leakage requirement for RPD not using a standardized connector ...	7
5.8 Validation by practical performance	8
5.8.1 General	8
5.8.2 Donning/doffing	8
5.8.3 Communication performance - hearing and speech	8
5.8.4 Eye irritation caused by the RPD	8
5.8.5 Fogging of visor	8
5.8.6 Ergonomic requirements	8
5.9 Requirements for elements/components	8
6 Requirements for filtering RPD	8
6.1 Determination of air flow rate of assisted RPD	8
6.2 Determination of the effect of temperature on flow rates for assisted RPD	9
6.3 Work of breathing, breathing resistance (peak pressure) and elastance	9
6.3.1 Work of breathing, breathing resistance (peak pressure) and elastance for unassisted RPD	9
6.3.2 Work of breathing, breathing resistance (peak pressure) and elastance for assisted RPD	10
6.4 CO ₂ concentration limits	12
6.4.1 CO ₂ concentration limits for assisted RPD	12
6.4.2 CO ₂ concentration limits of unassisted RPD	12
6.4.3 CO ₂ concentration limits for RI with standardized connector	12
6.5 Noise limit for assisted RPD	13
6.6 Temperature and humidity of inhaled air for RPD which protect against CO	13
6.7 Connections	13
6.7.1 General	13
6.7.2 Strength of connections – Connections to RI	14
6.7.3 Low pressure connections other than to the RI	16
6.8 Assessment of reliability	17
6.9 Pre-conditioning (Sequential/Non-sequential)	17
6.9.1 General	17

This is a preview of ISO 17420-2:2021. [Click here to purchase the full version from the ANSI store.](#)

6.9.2	Sequential pre-conditioning	18
6.9.3	Non-sequential pre-conditioning	19
6.10	Requirements for elements/components	19
6.10.1	Filters	19
6.10.2	Flexibility and resistance to deformation of hoses	30
6.11	Requirements for RPD with standardized connector	31
6.11.1	General	31
6.11.2	Filters with standardized connector	31
6.11.3	RI with standardized connector	33
6.11.4	Protection class determination for RPD using standardized connector	34
6.11.5	RPD using standardized connector and low pressure hoses	34
6.12	Multi-functional RPD	35
6.13	Requirements for optional features	35
6.13.1	General	35
6.13.2	Extreme low temperature requirements	35
6.13.3	Extreme high temperature requirements	36
6.13.4	Contact with hot surface	36
6.13.5	Hydration	36
6.13.6	Performance of RPD using prefilters	37
6.13.7	Use of RPD in potentially explosive atmospheres	37
6.13.8	Electromagnetic compatibility of RPD	37
7	Testing	37
7.1	General	37
7.2	Inspection	37
7.3	Testing of leak tightness using positive pressure	38
7.4	Contact with hot surface	38
8	Marking	38
8.1	General	38
8.2	Marking of RPD without separable components	38
8.3	Marking of RPD replacement parts	39
8.4	Marking of RPD components as part of a system	39
8.4.1	RI	39
8.4.2	Marking of particle, gas/vapour or combination filters	40
8.4.3	Other separable components	40
9	Information supplied by the RPD manufacturer	41
9.1	General	41
9.2	RPD	41
9.2.1	Minimum information	41
9.2.2	Additional information	42
9.3	RPD components and replacement parts	42
9.3.1	Particle, gas/vapour or combination filters	42
9.3.2	RI	43
9.3.3	Other components or replacement parts	44
Annex A (informative) Reliability		45
Annex B (informative) Example of failure modes and effect analysis (FMEA)		47
Annex C (normative) Test schedules		51
Annex D (normative) Normalisation of test results		74
Bibliography		76

This is a preview of ISO 17420-2:2021. Click [here](#) to purchase the full version from the ANSI store.

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 voluntary nature of standards, 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.

This document was prepared by Technical Committee ISO/TC 94, *Personal safety - Personal protective equipment*, Subcommittee SC 15, *Respiratory protective devices*.

A list of all parts in the ISO 17420 series can be found on the ISO website.

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.

Introduction

This document describes basic requirements for filtering respiratory protective devices (RPD) and its elements and components.

Requirements for RPD used in environments for special applications are given in the relevant parts of the ISO 17420 series.

Some test methods are described. For other test methods references are given to the ISO 16900 series "Methods of test and test equipment" or other test methods not developed by ISO/TC 94/SC 15.

[Annex A](#) gives information about reliability.

[Annex B](#) features an example of a FMEA (Failure Mode and Effects Analysis).

[Annex C](#) gives the test schedules including any pre-conditioning and number of samples.

[Annex D](#) provides information for normalisation of test results.

The sequence of testing follows the principle to minimize the necessary number of samples by carrying out destructive tests at the end. It also includes for safety reason that tests with test subjects are only carried out after the test samples have shown their safe performance in other tests.