PD ISO/TS 16976-5:2013

BSI Standards Publication

Respiratory protective devices — Human factors

Part 5: Thermal effects

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National foreword

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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.

ISBN 978 0 580 75106 6

ICS 13.340.30

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 October 2013.

Amendments issued since publication

Date	Text affected

PD ISO/TS 16976-5:2013

TECHNICAL SPECIFICATION

ISO/TS 16976-5

First edition
2013-11-01

Respiratory protective devices — Human factors —

Part 5: Thermal effects

Dispositifs de protection respiratoire — Facteurs humains — Partie 5: Effets thermiques

Reference number
ISO/TS 16976-5:2013(E)

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Published in Switzerland

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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.

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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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

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

ISO/TS 16976 consists of the following parts, under the general title *Respiratory protective devices — Human factors*:

— *Part 1: Metabolic rates and respiratory flow rates* [Technical Specification]

— *Part 2: Anthropometrics* [Technical Specification]

— *Part 3: Physiological responses and limitations of oxygen and limitations of carbon dioxide in the breathing environment* [Technical Specification]

— *Part 4: Work of breathing and breathing resistance: Physiologically based limits* [Technical Specification]

— *Part 5: Thermal effects* [Technical Specification]

— *Part 7: Hearing and speech* [Technical Specification]

— *Part 8: Ergonomic factors* [Technical Specification]

The following parts are under preparation:

— *Part 6: Psycho-physiological effects* [Technical Specification]

Introduction

For an appropriate design, selection and use of respiratory protective devices, basic physiological demands of the user must be considered. The function of a respiratory protective device, the way it is designed and used and the properties of its material may have a thermal effect on the human body.

This part of ISO/TS 16976 belongs to a series of documents providing basic physiological and anthropometric data on humans. It contains information about thermal effects associated with wearing respiratory protective devices

Respiratory protective devices — Human factors —

Part 5: Thermal effects

1 Scope

This part of ISO 16976 is one of a series of Technical Specifications that provide information on factors related to human anthropometry, physiology, ergonomics and performance for the preparation of standards for design, testing and use of respiratory protective devices. It contains information related to thermal effects of respiratory protective devices on the human body, in particular

— temperatures of surfaces associated with discomfort sensation and harmful effects on human tissues;

— thermal effects of breathing gas temperatures on lung airways and tissues;

— effects of breathing gas temperature and humidity on respiratory heat exchange;

— effects of respiratory protective devices on overall body heat exchange.

The information represents data for adult healthy men and women in the age 20–60 years.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7730, *Ergonomics of the thermal environment — Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria*

ISO 7933, *Ergonomics of the thermal environment — Analytical determination and interpretation of heat stress using calculation of the predicted heat strain*

ISO 11079, *Ergonomics of the thermal environment — Determination and interpretation of cold stress when using required clothing insulation (IREQ) and local cooling effects*

ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

ISO 13732-3, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 3: Cold surfaces*

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

ISO/TS 16976-1, *Respiratory protective devices — Human factors — Part 1: Metabolic rates and respiratory flow rates*

ISO/TS 16976-3, *Respiratory protective devices — Human factors — Part 3: Physiological responses and limitations of oxygen and limitations of carbon dioxide in the breathing environment*