PD ISO/TS 16840-12:2015

BSI Standards Publication

Wheelchair seating

Part 12: Apparatus and method for cushion envelopment testing

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National foreword

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

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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.

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).

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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 173, *Assistive products for persons with disability*, Subcommittee SC 1, *Wheelchairs*.

ISO 16840 consists of the following parts, under the general title *Wheelchair seating*:

— *Part 1: Vocabulary, reference axis convention and measures for body segments, posture and postural support surfaces*

— *Part 2: Determination of physical and mechanical characteristics of devices intended to manage tissue integrity — Seat cushions*

— *Part 3: Determination of static, impact and repetitive load strengths for postural support devices*

— *Part 4: Seating systems for use in motor vehicles*

— *Part 6: Simulated use and determination of the changes in properties — Seat cushions*

— *Part 10: Resistance to ignition of non-integrated seat and back support cushions — Requirements and test methods*

— *Part 11: Determination of perspiration dissipation characteristics of seat cushions intended to manage tissue integrity* [Technical Specification]

— *Part 12: Apparatus and method for cushion envelopment testing* [Technical Specification]

The following parts are under preparation:

— *Part 9: Clinical interface pressure mapping guidelines for seating* [Technical Report]

Future parts dealing with methods for determining heat and water vapour characteristics and clinical guideline for the measurement of postural support surfaces and body segments are planned.

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Introduction

This part of ISO 16840 provides details of test equipment and a method for the measurement of "performance" of a wheelchair cushion intended to use immersion and envelopment to reduce local areas of pressure (by effectively supporting more tissue). The primary elements that represent the basic cushioning effect of a cushion are immersion and envelopment. Immersion into the cushion (the depth that a body penetrates into the surface) and the envelopment of the body (the intimacy of the cushion to the body) combine to define the potential cushioning performance of the cushion. In this test, the distribution of forces across the surface of the indenter is evaluated with multiple indenter sizes and masses. The accommodation of the cushion to the changes in indenter size and mass are representative of the changes in size and mass of the occupant that can occur in the life of a wheelchair user or between different users.

Issues related to the use of devices that measure the forces between the body and a support surface (i.e. pressure mapping systems) have led to the use of an instrumented indenter, which has fewer sensors, but sensors which are high quality and exhibit repeatability, accuracy, and thus reliability.

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Wheelchair seating —

Part 12: Apparatus and method for cushion envelopment testing

1 Scope

This part of ISO 16840 specifies apparatus, test methods, and disclosure requirements for characterization of wheelchair seat cushion immersion and envelopment properties using instrumented indenters to characterize the interface pressure of each indenter and the test cushion by measuring the cushioning effects of immersion and envelopment. This part of ISO 16840 can be considered to expand the characterization of products intended to manage tissue integrity (ISO 16840-2) and provide a standardized indenter for other wheelchair seating tests. It does not provide information specific to cushion performance for a particular individual user.

This part of ISO 16840 includes a method that is specific to 220 mm and 255 mm indenters. Dimensions and loads are provided for the 380 mm indenter to allow for extension of the methods for bariatric applications.

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/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
adjustable cushion
cushion in which adjustments can be made in a reversible fashion

Note 1 to entry: See 3.2.

3.2
cushion adjustment
modification to the volume, size, hardness, pressure, or other physical characteristics of the cushion surface to accommodate the applied load and the indenter size in accordance with the manufacturer's instructions

3.3
base points
lowest two points of indenter when ready for use

Note 1 to entry: See Figures 6 and 7.

Note 2 to entry: The base points correspond with the ischial tuberosities on the human pelvis.

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