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Second edition
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Wheelchair seating —

Part 2: Determination of physical and mechanical characteristics of seat cushions intended to manage tissue integrity

Sièges de fauteuils roulants —

Partie 2: Détermination des caractéristiques physiques et mécaniques des coussins d'assise et dispositifs de répartition de pression

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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).

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

This second edition cancels and replaces the first edition (ISO 16840-2:2007), significant elements of which has been technically revised.

A list of all the parts of ISO 16840 can be found on the ISO website.

Introduction

Wheelchair seating is a sub-speciality of rehabilitation services involving the selection and provision of wheelchair seating products that provide improved body support and injury prevention to the wheelchair user. Seating products are designed and manufactured to meet the needs of persons with varying types and degrees of disability. Some products, such as wheelchair cushions, are designed to manage tissue integrity for persons who are at risk or have pressure ulcers.

The tests described herein are intended to differentiate performance characteristics between cushions and are not appropriate for ranking or scoring cushions or for directly matching these characteristics with the requirements of individual users. The link to clinical efficacy, although implied, has not been validated. It is intended that this document will evolve when the evidence of clinical relevance is confirmed. This document specifically describes test methods that characterize the physical and mechanical properties of seat cushions. Test conditions simulate a symmetric anatomy and posture. The loads used in this document are based on the 50th percentile wheelchair user and are not intended to characterize any cushion properties under bariatric loading conditions or to assess the weight capacity of a cushion. Annex B provides typical ranges for the values measured. Flammability testing is subject to either ISO 7176-16 or, for postural support devices intended to manage tissue integrity, ISO 16840-10.

Wheelchair seating —

Part 2: Determination of physical and mechanical characteristics of seat cushions intended to manage tissue integrity

1 Scope

This document specifies apparatus, test methods and disclosure requirements for wheelchair seat cushions intended to maintain tissue integrity and prevent tissue trauma. Test conditions simulate a symmetric anatomy and posture and do not represent cushion performance for specific individual users. Loads are intended to represent those seen under the pelvis of a 50th percentile wheelchair user and are not intended to assess the weight capacity of the cushion or to characterize the cushion under bariatric loads. It is possible that not all test methods apply to existing and future cushion technologies. It does not include test methods or requirements for determining the fire resistance of cushions.

This document can also be applicable to tissue integrity management devices used as other support systems, as well as to cushions used in situations other than a wheelchair.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1302:2002, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 7176-26, *Wheelchairs — Part 26: Vocabulary*

ISO 9073-8, *Textiles — Test methods for nonwovens — Part 8: Determination of liquid strike-through time (simulated urine)*

ISO 10993-1, *Biological evaluation of medical devices — Part 1: Evaluation and testing within a risk management process*

ISO 16840-1, *Wheelchair seating — Part 1: Vocabulary, reference axis convention and measures for body segments, posture and postural support surfaces*

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

FMVSS 209, *Standard No. 209; Seat Belt Assemblies. Federal Motor Vehicle Safety Standards, 49 CFR part 571.209, 1 October 1992*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7176-26, ISO 16840-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp