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Wheelchairs —

Part 8: Requirements and test methods for static, impact and fatigue strengths

Fauteuils roulants —

Partie 8: Prescriptions et méthodes d'essai pour la résistance statique, la résistance aux chocs et la résistance à la fatigue

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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 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 a disability*, Subcommittee SC 1, *Wheelchairs*.

This second edition cancels and replaces the first edition (ISO 7176-8:1998), which has been technically revised.

ISO 7176 consists of the following parts, under the general title *Wheelchairs*:

— *Part 1: Determination of static stability*

— *Part 2: Determination of dynamic stability of electric wheelchairs*

— *Part 3: Determination of the effectiveness of brakes*

— *Part 4: Energy consumption of electric wheelchairs and scooters for determination of theoretical distance range*

— *Part 5: Determination of dimensions, mass and manoeuvring space*

— *Part 6: Determination of maximum speed, acceleration and deceleration of electric wheelchairs*

— *Part 7: Measurement of seating and wheel dimensions*

— *Part 8: Requirements and test methods for static, impact and fatigue strengths*

— *Part 9: Climatic tests for electric wheelchairs*

— *Part 10: Determination of obstacle-climbing ability of electrically powered wheelchairs*

— *Part 11: Test dummies*

— *Part 13: Determination of coefficient of friction of test surfaces*

— *Part 14: Power and control systems for electrically powered wheelchairs and scooters – Requirements and test methods*

— *Part 15: Requirements for information disclosure, documentation and labelling*

— *Part 16: Resistance to ignition of postural support devices*

— *Part 19: Wheeled mobility devices for use as seats in motor vehicles*

— *Part 21: Requirements and test methods for electromagnetic compatibility of electrically powered wheelchairs and scooters, and battery chargers*

— *Part 22: Set-up procedures*

— *Part 25: Batteries and chargers for powered wheelchairs*

— *Part 26: Vocabulary*

— *Part 28: Requirements and test methods for stair-climbing devices*

A technical report (ISO/TR 13570-1) is also available giving a simplified explanation of these parts of ISO 7176.

Introduction

This part of ISO 7176 has been an important part of the strength testing of wheelchairs since its publication in 1998. It contains test methods and sets minimum requirements for static, impact, and fatigue strength of both the overall wheelchair and individually stressed components.

Several parts of this International Standard have been reviewed. In particular:

— the fatigue testing elements, including the speed and size of slat of the two-drum test machine, and the number of test cycles for both two drum and drop tests have been reviewed through empirical testing and confirmed;

— the failure criteria have been clarified, and permissible adjustments and repairs more clearly defined to minimize variation between laboratories;

— a more precisely defined setup procedure for the reference configuration of adjustable wheelchairs as given in ISO 7176-22;

— static, impact, and repeated load test procedures for Postural Support Devices (PSDs) have been revised and are contained in ISO 16840-3.

It is anticipated that all parts of this International Standard will continue to be developed and future revisions may include the results of ongoing work in the following areas:

— consideration of whether the fatigue test requirements should be revised for wheelchairs intended for use in less resourced settings;

— review of the test methods and apparatus to facilitate testing in less resourced settings;

— further development of the test dummies to improve the way in which they load the backs of test wheelchairs and, in particular, to improve their suitability for use with wheelchairs with low back supports.

Wheelchairs —

Part 8:
Requirements and test methods for static, impact and fatigue strengths

1 Scope

This part of ISO 7176 specifies requirements for static, impact, and fatigue strength of wheelchairs including scooters. It specifies the test methods for determining whether the requirements have been met. It also specifies requirements for disclosure of the test results.

The test methods can also be used to verify the manufacturers' claims that a product exceeds the minimum requirements of this part of ISO 7176.

This International Standard applies to occupant- and attendant-propelled manual wheelchairs and electrically powered wheelchairs intended to provide indoor and outdoor mobility for people with disabilities.

NOTE 1 For the purposes of this part of ISO 7176, "wheelchair(s)" is used as an abbreviation for manual wheelchair(s) or electrically powered wheelchair(s), including scooter(s), to which the requirements and test methods are applied.

NOTE 2 Clauses of this part of ISO 7176 will be used as a basis for developing requirements and test methods for wheelchairs not covered by this part of ISO 7176.

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 7176-6, *Wheelchairs — Part 6: Determination of maximum speed, acceleration and deceleration of electric wheelchairs*

ISO 7176-7, *Wheelchairs — Part 7: Measurement of seating and wheel dimensions*

ISO 7176-11, *Wheelchairs — Part 11: Test dummies*

ISO 7176-15, *Wheelchairs — Part 15: Requirements for information disclosure, documentation and labelling*

ISO 7176-22, *Wheelchairs — Part 22: Set-up procedures*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7176-7, ISO 7176-11, ISO 7176-26, and the following apply.

3.1
fracture
unintentional separation (of a component) into two or more pieces