INTERNATIONAL STANDARD

ISO 7176-10

Second edition
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Wheelchairs —

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

Fauteuils roulants —

Partie 10: Détermination de l'aptitude des fauteuils roulants électriques à gravir les obstacles

Reference number
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 7176-10 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 7176-10:1988), 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 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 upholstered parts — Requirements and test methods*

— *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 23: Requirements and test methods for attendant-operated stair-climbing devices*

— *Part 24: Requirements and test methods for user-operated stair-climbing devices*

— *Part 26: Vocabulary*

A Technical Report (ISO/TR 13570-1, *Wheelchairs — Part 1: Guidelines for the application of the ISO 7176 series on wheelchairs*) is also available, giving information on how to use the ISO 7176 standards when selecting a wheelchair and helping readers to understand the purpose for, and content of, the International Standards on wheelchairs.

Introduction

The ability of an electrically powered wheelchair to climb and descend obstacles can be an important factor in selecting the most appropriate wheelchair for a person, both in terms of access and safety.

Access may be affected by the ability of the wheelchair to safely negotiate obstacles, such as door thresholds, changes in heights of driving surfaces, and kerbs.

The heights of obstacles a wheelchair is capable of climbing can differ from the heights of those it can descend. However, it is important for wheelchair operators and prescribers to be able to know the height of an obstacle that a wheelchair can both ascend and descend. The obstacle-climbing and -descending performance of a wheelchair can also depend on the technique used to operate the wheelchair. The performance can also be affected by the use of alternative operating modes, such as four-wheel drive.

This part of ISO 7176 specifies a consistent method for determining the obstacle-climbing and -descending ability of electrically powered wheelchairs to provide comparable results.

Wheelchairs —

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

1 Scope

This part of ISO 7176 specifies test methods for determining the ability of electrically powered wheelchairs, including scooters, intended to carry one person, with a maximum nominal speed not exceeding 15 km/h, to climb and descend obstacles.

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

ISO 7176-13*, Wheelchairs — Part 13: Determination of coefficient of friction of test surfaces*

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 part of ISO 7176, the terms and definitions given in ISO 7176-26 apply.

4 Principle

A number of tests are performed to determine the ability of electrically powered wheelchairs to negotiate obstacles such as kerbs and steps.

5 Test equipment

5.1 Test plane, a flat and hard plane such that its whole surface is contained between two imaginary horizontal parallel planes 5 mm apart and horizontal within ± 0,5°, and with a coefficient of friction as specified in ISO 7176-13.

NOTE A test plane capable of accommodating the test obstacle (5.2) and the test wheelchair, placed 0,5 m in front of the obstacle, and facing it, is usually sufficient.