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Wheelchairs —

Part 6: Determination of maximum speed of electrically powered wheelchairs

Fauteuils roulants —

Partie 6: Titre manque

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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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 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*, Subcommittee SC 1, *Wheelchairs*.

This third edition cancels and replaces the second edition (ISO 7176-6:2001), which has been technically revised.

The main changes compared to the previous edition are as follows:

— requirements concerning acceleration, deceleration and speed on ramps have been removed.

A list of all parts in the ISO 7176 series can be found on the ISO website.

Introduction

Maximum speed can be an important factor in the selection of the most appropriate wheelchair for individual people.

Maximum speed can have an influence on whether an electrically powered mobility device may be used on or off footpaths, or both, depending upon local legislation. Some people's main concern may be to travel as fast as possible, whereas other people may be apprehensive of higher speeds. In addition, other tests in the ISO 7176 series may require the determination of maximum speed in order to carry out their procedures.

These tests specify a consistent method of determining maximum values of speed to provide comparable results.

Wheelchairs —

Part 6: Determination of maximum speed of electrically powered wheelchairs

1 Scope

This document specifies test methods for determining the maximum speed of electrically powered wheelchairs, including scooters, intended to carry one person with a maximum nominal speed not exceeding 15 km/h (4,167 m/s) on a level surface.

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 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*

3 Terms and definitions

No terms and definitions are listed in this document.

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

— IEC Electropedia: available at http://www.electropedia.org/

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

4 Apparatus

4.1 Instrumentation, that may need to be added to the test dummy, in which case its mass shall not exceed 5 % of the total dummy mass.

4.2 Horizontal test plane, made up of a rigid, flat, horizontal surface of sufficient size to conduct the tests and with a coefficient of friction that meets the requirements of ISO 7176-13.

NOTE The floor of a typical large building used for manufacturing or indoor leisure with, for example, a concrete, asphalt or wooden floor is acceptable.

4.3 Speed measurement device, to measure and record speed up to 5 m/s with an accuracy of ± 0,1 m/s and a sample rate of at least 60 Hz.

4.4 Test dummy, as specified in ISO 7176-11, or a human test occupant according to ISO 7176-22.

Mass added to the wheelchair for the purposes of control or instrumentation should not significantly affect the overall mass distribution of the wheelchair. The overall mass of the loaded wheelchair shall be adjusted to compensate for any such added mass.

4.5 Supplementary weight, shall be added to a human test driver to give the mass distribution equivalent to the relevant dummy.

5 Preparation of the test wheelchair

Prepare the test wheelchair as follows before commencing the sequence of tests.

a) Set up the wheelchair as specified in ISO 7176-22.

b) Set any controls which are accessible to the user without special tools and which influence the maximum speed to provide a maximum value.

NOTE These controls include programmable controls, touch pads, computer interfaces, etc.

c) If a dummy is used, a remote controller may be used to operate the wheelchair controls. This may be done by a telemetry system, by an operator running alongside or by other similar means.

6 Determination of maximum speed on a horizontal surface

WARNING — This testing is potentially hazardous to a human test driver and test personnel. Appropriate safety precautions should be taken to avoid injury. Any additional weights should be firmly secured.

a) Ensure that the electrical driving system reaches a temperature typical of working conditions by driving the wheelchair for a distance of approximately 1,5 km.

b) Within 5 min of completing a), place the wheelchair on the horizontal test plane.

c) Drive the wheelchair forwards in a straight line on the horizontal test plane with its control device set to full speed command ensuring that it achieves its maximum speed.

d) Measure the maximum speed achieved with the means specified in 4.3 and record this value, V_m, in m/s.

e) Repeat a) to d) for an additional two runs.

f) Determine and record the value of the arithmetic mean, V_{mm}, of the three values of V_m measured in d) and e).

g) Repeat a) to f) but driving with the wheelchair travelling in reverse.

Align the castor orientations for this test to maintain a straight line of travel if necessary.

7 Test report

The test report shall contain the following information:

a) a reference to this document, i.e. ISO 7176-6:2018;

b) the name, address and accreditation status of the testing institution;

c) the name and address of the manufacturer of the wheelchair;

d) the date of issue of the test report;

e) the wheelchair type and any serial and batch numbers;

f) the total mass of the dummy used or, if a person is used, the mass of the driver and weights;

NOTE The dummy mass includes the mass of any instrumentation attached to the dummy.

g) details of the set-up of the wheelchair as specified in ISO 7176-22;

h) a photograph of the wheelchair equipped as during the test;

i) the result of the test specified in Clause 6. Table 1 provides a recommended format for disclosure.

Table 1 — Test results, maximum speed

Maximum speed (V_{mm}) m/s	
forwards, horizontal	
rearwards, horizontal	

8 Disclosure

The following result shall be disclosed in the manufacturer's specification sheets within the format specified in ISO 7176-15:

maximum speed, forwards on horizontal: ..... km/h

NOTE Units of measurement are different from m/s used in the test report (Clause 7).