
Wheelchairs —

**Part 1:
Determination of static stability**

Fauteuils roulants —

Partie 1: Détermination de la stabilité statique



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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 disability*, Subcommittee SC 1, *Wheelchairs*.

This third edition cancels and replaces the second edition (ISO 7176-1:1999), all clauses, sub-clauses, tables, figures, and annexes of which have 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 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

It is important to know the static-stability characteristics of a wheelchair for prescription and adjustment purposes. Some occupants need large reserves of stability to ensure their safety while others prefer finely balanced wheelchairs which have better manoeuvrability. Static stability is only one factor affecting dynamic stability, others being the position of the wheelchair operator in the wheelchair, the skill of the wheelchair operator, the manner in which the wheelchair is propelled, and the environment in which the wheelchair is operated.

This part of ISO 7176 specifies tests in which static stability is measured with parking brake(s) applied, as is the case if the wheelchair is standing on a slope. Tests are also made with the wheels unlocked, simulating the situation where the wheelchair is standing on a slope with the wheels against obstacles, the situation on a level surface with the wheels unlocked and the wheelchair occupant reaching for an object, or instability while rolling. Tests are also made that determine the static stability of the wheelchair when it is protected against tipping over by a forward and/or rearward anti-tip device, and the effectiveness of those anti-tip devices if the wheelchair tips in that direction.

Wheelchairs —

Part 1: Determination of static stability

1 Scope

This part of ISO 7176 specifies test methods for determining the static stability of wheelchairs. It is applicable to manual and electrically powered wheelchairs, including scooters, with a maximum speed not greater than 15 km/h, intended to provide indoor and/or outdoor mobility for one disabled person whose mass is within the range represented by ISO 7176-11.

For active stability-controlled wheelchairs, this part of ISO 7176 applies to the device in a stable, parked state.

This part of ISO 7176 provides a method for the measurement of the tipping angles (either wheelchair tipping angle or anti-tip device tipping angle), but this method is not applicable to wheelchairs with lateral anti-tip devices and does not consider sliding on the ground.

This part of ISO 7176 also includes requirements for test reports and information disclosure.

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 7176-11, *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 in ISO 7176-26 and the following apply.

3.1

active stability-controlled wheelchair

wheelchair that actively controls or enhances its stability (by electronic or other means) when static and/or when in motion

3.2

anti-tip device

device which limits the extent of tipping of a wheelchair

Note 1 to entry: Anti-tip devices can operate in forward, rearward, or lateral directions. Some anti-tip devices have a spring suspension. Some running wheels can act as anti-tip devices, but their primary function is to be running wheels. Foot supports can serve as anti-tip devices if the manufacturer designates that they are intended to serve in that capacity. A change in the wheelchair configuration or control characteristics to enhance stability is not considered an anti-tip device.