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## Wheelchairs —

### Part 7:

### Measurement of seating and wheel dimensions

*Fauteuils roulants —*

*Partie 7: Mesurage des dimensions d'assise et des roues*



Reference number  
ISO 7176-7:1998(E)

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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.

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.

International Standard ISO 7176-7 was prepared by Technical Committee ISO/TC 173, *Technical systems and aids for disabled or handicapped persons*, Subcommittee 1, *Wheelchairs*.

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 efficiency of brakes*
- *Part 4: Energy consumption of electric wheelchairs and scooters for determination of theoretical distance range*
- *Part 5: Determination of overall dimensions, mass and turning space*
- *Part 6: Determination of maximum speed, acceleration and retardation 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 electric wheelchairs*
- *Part 11: Test dummies*

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- *Part 13: Determination of coefficient of friction of test surfaces*
- *Part 14: Power and control systems of electric wheelchairs — 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*

The following parts are also on the programme of work:

- *Part 17: Serial interface for electric wheelchair controllers*
- *Part 18: Stair-traversing devices*
- *Part 19: Wheeled mobility devices for use in motor vehicles*
- *Part 20: Determination of the performance of stand-up wheelchairs*
- *Part 21: Requirements and test methods for electromagnetic compatibility of powered wheelchairs and motorized scooters*
- *Part 22: Set-up procedure for adjustable wheelchairs*

A Technical Report will also be made available giving a simplified explanation of these parts of ISO 7176.

Annex A forms an integral part of this part of ISO 7176. Annex B is for information only.

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## Introduction

The purpose of this part of ISO 7176 is to ensure comparability of information on seating and wheel dimensions by specifying a consistent, repeatable method of measurement that provides information relevant to prescribers' needs.

Wheelchair seats and wheels tend to involve deformable, contoured and flexible structures with few consistent reference points to which reliable measurements can be made. In the past, manufacturers have developed their own methods of measurement that differ from each other. This prevents comparison of measurements from one manufacturer to those of another.

In addition, measurements are sometimes selected for reasons of ease of measurement rather than for clinical usefulness. For example, seat depth for sling seats is usually determined along the sling material and does not consider the gap between the back of the seat and the backrest. This gap can be as large as 5 cm and significantly affects the wheelchair's seat depth.

Further problems can arise from adjustable features which can interact to generate, potentially, very large numbers of measurements.

This part of ISO 7176 involves first placing a standardized loader gauge in the wheelchair seat. Two sizes of loader gauge are specified corresponding respectively to adult and child body sizes. The gauge deforms any flexible structures in a repeatable manner and provides reference points to which dimensions can be measured. The positions at which measurements are made are described relative to the loader gauge. Accurate positioning of the gauge is essential for repeatability of results and is specified in detail in the text. Finally, to facilitate comparisons of different manufacturers' data, a format is included in which results are to be presented.

It should be noted that wheelchairs are often produced in model ranges, consisting of a basic model with a series of variations from this basic model. It is the responsibility of those commissioning the measurements to select which model variations are measured.