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## Wheelchair seating —

Part 1:

### **Vocabulary, reference axis convention and measures for body segments, posture and postural support surfaces**

*Sièges de fauteuils roulants —*

*Partie 1: Vocabulaire, convention des axes de référence et mesures  
des segments corporels, des surfaces de posture et du siège*



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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 16840-1 was prepared by Technical Committee ISO/TC 173, *Assistive products for persons with disability*, Subcommittee SC 1, *Wheelchairs*.

ISO 16840 consists of the following parts, under the general title *Wheelchair seating*:

- *Part 1: Vocabulary, reference axis convention and measures for body segments, posture and postural support surfaces*
- *Part 2: Determination of physical and mechanical characteristics of devices intended to manage tissue integrity — Seat cushions*
- *Part 3: Determination of static, impact and repetitive load strengths for postural support devices*

The following parts are under preparation:

- *Part 4: Seating systems for use in motor vehicles*
- *Part 5: Determination of pressure relief characteristics of seat cushions intended to manage tissue integrity*

## Introduction

The development of wheelchair seating as a sub-specialty of rehabilitation services has been occurring over the last several decades. This practice involves the selection and provision of wheelchair seating products that provide improved body support, movement control, and injury prevention for the wheelchair user. Inherent in this selection process is the measurement and communication of the anthropometrics and postural measures of the seated person, as well as the orientation, location and linear measures of the person's seating support surfaces.

However, there has been tremendous variation in the use of the terminology and definitions related to the clinical measures of a seated individual. Standard definitions and terms are lacking for communicating critical postural information and support surface parameters in a way that is uniformly useful to service providers, researchers, manufacturers, wheelchair users and purchasers when selecting and providing wheelchair seating devices.

The purpose of this part of 16840 is to specify standardised geometric terms and definitions for describing and quantifying a person's anthropometric measures and seated posture, as well as the spatial orientation and dimensions of a person's seating support surfaces. This also allows for the systematic monitoring of a person's seated posture change over time.

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# Wheelchair seating —

## Part 1:

## Vocabulary, reference axis convention and measures for body segments, posture and postural support surfaces

### 1 Scope

This part of ISO 16840 applies to seating intended to provide postural support within a wheelchair. It specifies:

- a) a global coordinate system that permits the determination and recording of a person's posture while seated in a wheelchair;
- b) the standard terms and definitions for use in describing both the posture and the anthropometrics of a person seated in a wheelchair;
- c) the terms and definitions for describing the dimensions, location and orientation of seating support surfaces, which together comprise the body support system.

This part of ISO 16840 does not specify any methods for use in measuring a person's seated posture, nor does it define terms for dynamic physiological movements (such as flexion or extension).

This part of 16840 might be applicable to seating other than that intended to be used within a wheelchair.

### 2 General terms and definitions

#### 2.1

##### **absolute angle**

angle which represents the orientation in space of a body segment or support surface reference plane relative to the gravitational axis system

NOTE See 5.2.

#### 2.2

##### **body centreline**

vertical line falling on the midsagittal plane of the body, as viewed in the frontal plane

#### 2.3

##### **body segment line**

line defined by two designated body landmarks, either palpated or calculated, used in determining angular positions of body segments

#### 2.4

##### **contact surface**

surface of the seating support in contact with the seated person's body