TECHNICAL REPORT

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Guidelines for the application of the ISO 7176 series on wheelchairs

Lignes directrices pour l'application de la série ISO 7176 sur les fauteuils roulants

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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 3.

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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this Technical Report may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 13570, was prepared by Technical Committee ISO/TC 173, *Technical systems and aids for disabled or handicapped persons*, Subcommittee SC 1, *Wheelchairs*.

This Technical Report is based on the book:

A Guide to Wheelchair Selection: How to Use the ANSI/RESNA Wheelchair Standards to Buy a Wheelchair

written by Peter Axelson, Jean Minkel and Denise Chesney, published in 1994 by the Paralyzed Veterans of America, Washington, DC, USA.

Guidelines for the the application of the ISO 7176 series on wheelchairs

1 Scope

The purpose of this Technical Report is to explain how you can use the International Standards on wheelchairs to select your next wheelchair. The actual standards are very technical and, at first glance, you may not understand how this information will help you select a wheelchair or scooter. This Technical Report is meant to help you understand the purpose for and content of International Standards on wheelchairs.

This Technical Report is divided into six clauses.

a) How to use this Technical Report.

b) Standardized testing and information disclosure: Provides background information on standardized testing of wheelchairs. Discusses how chairs are tested and how information is disclosed.

c) General considerations: Discusses general considerations related to choosing a powered or manual wheelchair.

d) Incorporating personal body characteristics: Relates your physical characteristics to the fit of a chair, either manual or powered.

e) Manual wheelchairs: Discusses manual wheelchair test procedures.

f) Powered wheelchairs: Discusses powered wheelchair test procedures; focuses on three- and four-wheeled scooters as well as full-sized powered wheelchairs.

In the manual and powered wheelchair sections, the test procedures are grouped into three categories:

— performance,

— safety, and

— dimensions.

For each test procedure, this Technical Report includes

— reasons why you might need this information,

— a brief description of the standardized test procedure,

— how the results of the test will be disclosed in the manufacturer’s technical product literature, and

— how to interpret the results of the test for your own situation.

2 How to use this Technical Report

If you are an experienced rider, you may know which elements of performance, safety and dimension are important to you. If not, or if you are a novice, we highly recommend that you involve other knowledgeable people in selecting your wheelchair. Many rehabilitation specialists have the expertise and training in using these standards and can help you select an appropriate wheelchair.

An excellent approach to the wheelchair selection process is to set priorities based on your mobility and seating needs. Setting priorities will help you identify the features that are most important to you and those on which you are willing to compromise. For example, if you live in a small apartment and need to fit your wheelchair into the boot (trunk) of your car, you will probably want to look specifically at the overall dimensions, foldability, and weight of the wheelchair. On the other hand, if you use a van and have an accessible apartment or home, you may not need a folding wheelchair. This Technical Report will help you understand the test results that pertain to the factors most important to you. Armed with this information, you will be able to accurately compare products and make an informed purchasing decision.

3 Standardized testing and information disclosure

3.1 General

Purchasing a wheelchair can be a harrowing experience and finding the right chair among so many choices might seem impossible. Comparing wheelchair characteristics and performance has been difficult in the past because manufacturers used different standards and procedures to measure and test their chairs. For example, one manufacturer measured seat width from the outside of the seat rails, another measured from inside the rails, and a third measured the distance between the armrest panels. Thus, if you requested a chair with a seat width of 18 inches, the actual distance from the outside of the seat rails could be anywhere from 17 inches to 19 inches. This inconsistency, as well as a general concern for user safety, led to the development of standardized wheelchair measurements and test procedures. The results of these procedures will provide you with the information you need for true comparison shopping.

3.2 Background on tests and standards

The ISO Technical Committee on wheelchairs has been working to provide consumers with objective information about the characteristics and performance of wheelchairs. The committee includes rehabilitation engineers, wheelchair manufacturers, agency representatives, wheelchair users, and wheelchair prescribers.

The standards developed by the committee consist of a number of test procedures that apply to all wheelchairs and some that apply only to powered wheelchairs, including scooters. The test procedures are detailed instructions on how to perform the tests or measurements on wheelchairs. Some of the test procedures suggest minimum performance criteria for durability and safety, while others disclose the results of the tests for comparison purposes. The information obtained from the tests is designed to help you make better-educated selections. See Figure 1. The standardized test procedures also allow you to compare the test results of wheelchairs from different manufacturers. Since many of the test procedures set minimum performance levels, they also help manufacturers produce better products.

3.3 Standards increase your buying power

The standards are voluntary: manufacturers are not required by law to use the test procedures. However, if consumers start using the results as a basis for wheelchair selection, the manufacturers who do not use the standards may lose sales. The US Department of Veterans Affairs (VA), the single largest purchaser of wheelchairs in the United States, is adopting the standards for future wheelchair purchasing. Marketplace pressure will most likely encourage overall compliance with the standards.

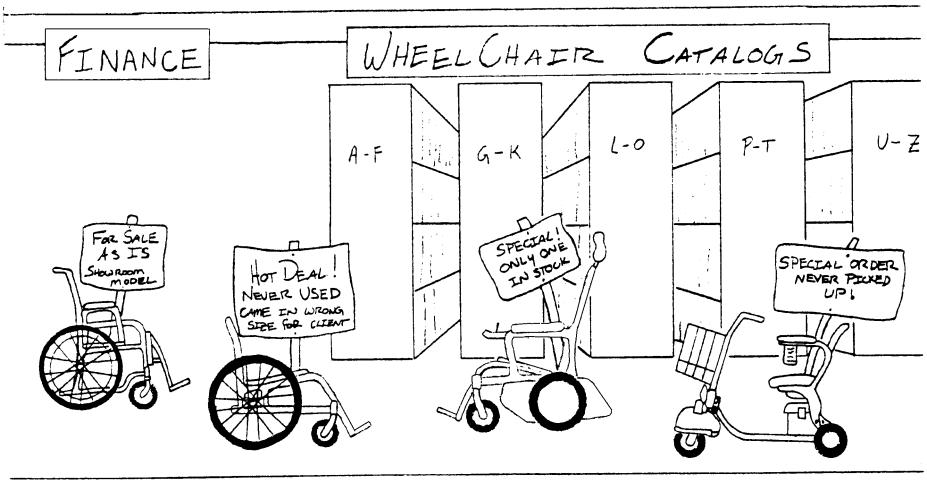

Figure 1 — Finding the right chair among so many choices might seem impossible

3.4 More about International Standards

To gain the maximum benefit from the standardized testing, both consumers and professionals must understand how to use the information.

The following is a list of the test standards, listed by their ISO number designation, that apply to all wheelchairs, with a brief description of the test procedure.

ISO 6440:1985, Wheelchairs — Nomenclature, terms and definitions. This part establishes the terms and definitions used in the test procedures.

ISO 7193:1985, Wheelchairs — Maximum overall dimensions. This part establishes suggested maximum dimensions of a chair for other organizations to use as guidelines for architectural accessibility.

ISO 7176-1:1999, Wheelchairs — Part 1: Determination of static stability. This test determines how stable the wheelchair is when it is resting on a sloped surface.

ISO 7176-3:1988, Wheelchairs — Part 3: Determination of efficiency of brakes. This test determines how well the wheel locks (parking brakes) prevent the wheelchair from rolling on a sloped surface. This test also determines the minimum stopping distance of a powered wheelchair at its maximum speed.

ISO 7176-5:1986, Wheelchairs — Part 5: Determination of overall dimensions, mass and turning space. This part addresses the overall length, width, height, folded width, mass and turnaround space of the chair.

ISO 7176-7:1998, Wheelchairs — Part 7: Measurement of seating and wheel dimensions. This part addresses the dimensional information needed to fit a chair to a rider. Standard methods of measurement eliminate the problems that result from variations in measurement methods.

ISO 7176-8:1998, Wheelchairs — Part 8: Requirements and test methods for static, impact and fatigue strengths. This part addresses the strength and durability of a wheelchair.

ISO 7176-11:1992, Wheelchairs — Part 11: Test dummies. This part addresses the dimensional and mass (weight) specifications of the dummies to be used when conducting the tests.