AS/NZS 3696.19:2009

Australian/New Zealand Standard™

Wheelchairs

Part 19: Wheeled mobility devices for use as seats in motor vehicles (ISO 7176-19:2008, MOD)

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee ME-067, Mobility Appliances for People with Disabilities. It was approved on behalf of the Council of Standards Australia on 28 January 2009 and on behalf of the Council of Standards New Zealand on 9 March 2009.
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The following are represented on Committee ME-067:

Association of Consultants in Access Australia
Australian Association of Occupational Therapists
Australian Rehabilitation and Assistive Technology Association
Consumers Federation of Australia
Engineers Australia
Independent Living Centres Australia
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-067, Mobility Appliances for People with Disabilities.

Standard is an adoption with national modification, and has been reproduced, from, ISO 7176-19:2008, *Wheelchairs,* Part 19: *Wheeled mobility devices for use as seats in motor vehicles*. Variations to ISO 7176-19:2008 for application in Australia and New Zealand are set out in Appendix ZZ following the source text.

Appendix ZA has been included to provide guidance on the selection and subsequent use of wheeled mobility devices that are intended to be used as a seat in a motor vehicle.

This Standard is one of a series of methods of test and measurement for wheelchairs.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text, 'this part of ISO 7176' should read 'this Australian/New Zealand Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
ISO		AS/NZS	
10542	Technical systems and aids for disabled or handicapped persons—Wheelchair tiedown and occupant-restraint systems	10542	Technical systems and aids for disabled or handicapped persons—Wheelchair tiedown and occupant-restraint systems
10542-1	Part 1: Requirements and test methods for all system	10542.1	Part 1: Requirements and test methods for all systems
10542-2	Part 2: Four-point strap-type tiedown systems	10542.2	Part 2: Four-point strap-type tiedown systems
ECE		AS/NZS	
Regulation 16	Uniform provision concerning the approval of safety belts and restraint systems for adult occupants of power-driven vehicles, revision 3, amendment 2, 16 August 1993	2596	Seatbelt assemblies for motor vehicles (ECE Regulation No. 16, MOD)

Only international reference documents that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms 'normative' and 'informative' are used to define the application of the annex or appendix to which they apply. A 'normative' annex or appendix is an integral part of a standard, whereas an 'informative' annex or appendix is only for information and guidance.

CONTENTS

INTRODUCTION

Transportation safety research has shown that the vehicle seat is an important part of the occupant-restraint system and therefore plays a key role in reducing the risk of serious injuries to vehicle occupants in many types of vehicle crashes. In particular, the seat needs to allow and facilitate the proper positioning of belt restraints on the skeletal regions of the occupant, not add to occupant loads during impact loading, and provide effective support for the occupant so that the belt restraint will remain in place over skeletal regions throughout a crash. People with physical disabilities must often remain in their wheelchairs whilst travelling in motor vehicles as drivers or passengers. Since many wheelchairs were not designed for this purpose, wheelchair-seated occupants are often at higher risk of injury in crashes than are people seated in seats provided by the vehicle manufacturer.

ISO 10542-1 provides design, performance, labelling, and the manufacturer's literature requirements, and specifies associated test methods, for wheelchair tiedown and occupant-restraint systems (WTORS). This part of ISO 7176 addresses the seating part of wheelchair-user occupant-protection systems by establishing design, performance, labelling, and the manufacturer's literature requirements, as well as associated test methods, for wheelchairs that may be used as seats in motor vehicles.

Whilst wheelchairs may be secured by various types of tiedown and securement systems that were available throughout the world at the time this part of ISO 7176 was developed, effective wheelchair securement in the real world requires compatibility of the wheelchair tiedown system available in the vehicle and the method of securement provided on the wheelchair. At the time that this part of ISO 7176 was developed, the four-point strap-type tiedown was considered to be the most effective, common, and universally adaptable system for securing a wide range of wheelchair types and sizes. For these reasons, this part of ISO 7176 requires that wheelchairs intended for use as seats in motor vehicles provide for securement using a four-point strap-type tiedown system by providing at least four designated securement points, with two in front and two in the back. However, this part of ISO 7176 also provides for evaluating wheelchairs that are also designed for securement by other methods, such as docking-type securement systems.

To evaluate the crashworthiness performance of a wheelchair, Annex A specifies procedures for dynamically testing a wheelchair loaded with an appropriate-size crash-test dummy using a 48 km/h crash pulse with the wheelchair secured facing forward on the impact sled. This test is based on well-documented motor vehicle crash and injury statistics, which show that more than 50 % of all serious injuries to occupants of motor vehicles occur in frontal crashes, and that more than 95 % of frontal crashes result in a longitudinal change in vehicle speed of less than 48 km/h. Dynamic performance for forward-facing wheelchairs in rear and side impacts might be addressed in future International Standards.

This part of ISO 7176 has also been developed with the recognition that the use of a pelvic-belt restraint alone does not provide the wheelchair occupant with the same level of crash protection in a frontal impact as the use of both pelvic-belt and shoulder-belt restraints. Therefore, the provisions and test methods of this part of ISO 7176 are based on the use of both pelvic- and shoulder-belt-type restraints.

Although the four-point strap-type tiedown system was considered to be the most common and universal method for effectively securing a wide range of wheelchairs at the time this part of ISO 7176 was developed, it is a method of wheelchair securement that requires the involvement of a second person and cannot be implemented by the wheelchair occupant. Accordingly, it is desirable to progress toward a securement method that can be implemented independently by the wheelchair-seated passenger who may travel in different public transportation and private vehicles. As a step toward this goal, this part of ISO 7176 includes a normative annex (Annex F) that establishes universal docking interface geometry (UDIG) for securement points on wheelchairs when it is intended for the wheelchair to be secured by docking-type securement devices in public transportation and/or multiple private vehicles.

Finally, this part of ISO 7176 can be viewed in the totality of daily wheelchair use and the range of standards to which all wheelchairs are expected to comply. Wheelchairs are designed primarily to serve as effective mobility devices and, in that respect, they must first conform to the applicable requirements set forth in other

parts of the ISO 7176 series. Transportation is only one of many daily activities that introduce unique circumstances and requirements that wheelchairs and wheelchair occupants may experience. Wheelchair products that comply with this part of ISO 7176 will have additional features that provide increased levels of occupant security and safety whilst their occupants are riding in motor vehicles. However, a wheelchair's failure to comply with this part of ISO 7176 cannot be used to limit access to, and availability of, motor vehicle transportation for wheelchair users.

AUSTRALIAN/NEW ZEALAND STANDARD

Wheelchairs

Part 19:
Wheeled mobility devices for use in motor vehicles
(ISO 7176-19:2008, MOD)

1 Scope

This part of ISO 7176 applies to all manual and powered wheelchairs, including scooters, which, in addition to their primary function as wheeled mobility devices, are also likely to be used as forward-facing seats in motor vehicles by children and adults with a body mass equal to or greater than 22 kg. This part of ISO 7176 specifies wheelchair design requirements, performance requirements and associated test methods, and requirements for wheelchair labelling, presale literature, user instructions and user warnings. It applies to complete wheelchairs, including a base frame and seating system, as well as to wheelchairs equipped with add-on adaptive components designed to facilitate compliance with one or more of the requirements.

2 Normative references

The following referenced documents are indispensable for the application 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 3795, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 6487, *Road vehicles — Measurement techniques in impact tests — Instrumentation*

ISO 7176-5, *Wheelchairs — Part 5: Determination of dimensions, mass and manoeuvring space*

ISO 7176-15:1996, *Wheelchairs — Part 15: Requirements for information disclosure, documentation and labelling*

ISO 7176-22:2000, *Wheelchairs — Part 22: Set-up procedures*

ISO 7176-26:2007, *Wheelchairs — Part 26: Vocabulary*

ISO 10542-1, *Technical systems and aids for disabled or handicapped persons — Wheelchair tiedown and occupant-restraint systems — Part 1: Requirements and test methods for all systems*

ISO 10542-2, *Technical systems and aids for disabled or handicapped persons — Wheelchair tiedown and occupant-restraint systems — Part 2: Four-point strap-type tiedown systems*

FMVSS 209:2004, Standard No. 209, *Seat belt assemblies.* Federal Motor Vehicle Safety Standards, 49 CFR 571.209, 1 October, 2004

ECE Regulation 16, *Uniform provisions concerning the approval of safety belts and restraint systems for adult occupants of power-driven vehicles*, Revision 3, Amendment 2, 16 August 1993