AS/NZS ISO 16840.3:2015
ISO 16840-3:2014

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Australian/New Zealand Standard™

Wheelchair seating

Part 3: Determination of static, impact and repetitive load strengths for postural support devices

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee ME-067, Assistive Technology Products for Persons with Disability. It was approved on behalf of the Council of Standards Australia on 14 September 2015 and on behalf of the Council of Standards New Zealand on 31 July 2015.
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The following are represented on Committee ME-067:

Assistive Technology Suppliers Australasia
Association of Consultants in Access Australia
Australian Rehabilitation an Assistive Technology Association
Bus and Coach Association of New Zealand
Commercial Vehicle Industry Association of Australia
Department of Family and Communities, SA
Employer Chamber of Commerce Central
Engineers Australia
Independent Living Centres Australia
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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS ISO 16840.3:2014.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-067, Assistive Technology Products for Persons with Disability.

The objective of this Standard is to specify the strength requirements and test methods for wheelchair seating systems and components (postural support devices) in line with international requirements.

This Standard is identical with and has been reproduced from the 2015 corrected version* of ISO 16840-3:2014, *Wheelchair seating*, Part 3: *Determination of static, impact and repetitive load strengths for postural support devices*.

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

(a) In the source text 'this part of ISO 16840' should read 'this Australian/New Zealand Standard'.

(b) A full point substitutes 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	
898	Mechanical properties of fasteners	4291	Mechanical properties of fasteners made of carbon steel and alloy steel
898-7	Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm	4291.7	Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm
		AS/NZS ISO	
7176	Wheelchairs	7176	Wheelchairs
7176-26	Part 26: Vocabulary	7176.26	Part 26: Vocabulary

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

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* The 2015 corrected version of ISO 16840-3:2014 incorporated a clarification of Clause 4.6, Item d).

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INTRODUCTION

Postural support devices (PSD), constructed as additional components to wheelchair seating or as wheelchair seating in its own right, are widely available and used extensively by people with disabilities. The selection or prescription of the most appropriate PSD is intended to be, where appropriate, partially dependent on knowledge of its ability to withstand static, impact, and repeated loads. This part of ISO 16840 is intended to specify test methods to provide this information.

The tests involve mounting the PSD on rigid test fixtures to simulate mounting on a wheelchair. Rigid test fixtures are utilized to provide a worst-case situation, which is repeatable and avoids destroying multiple wheelchairs during testing. Static, impact, and repeated loads are then applied to simulate normal usage. In some of the defined tests, performance criteria have been established. In others, no minimum requirements are currently specified. Tests are repeated at increasing forces or torques until one or more performance limits are reached. Repetitive load tests with a specific load or torque application are intended to induce fatigue-related performance limits.

Tests represented in this part of ISO 16840 were derived from ISO 7176-8. Many of the test principles and much of the test equipment are the same for this part of ISO 16840 and ISO 7176-8.

It is anticipated that parts of this part of ISO 16840 will continue to be developed and that future revisions can include the results of ongoing work in the following areas:

— further development of the test forces based on clinical data is necessary in order to determine actual impact, static, and repetitive forces that PSDs are subjected to;

— further work for the collection of data on the most common failures experienced in actual use of PSDs is ongoing.

AUSTRALIAN/NEW ZEALAND STANDARD

Wheelchair seating

Part 3:
Determination of static, impact and repetitive load strengths for postural support devices

1 Scope

This part of ISO 16840 specifies test methods for the determination of static, impact, and repetitive load strengths as well as disclosure requirements for postural support devices (PSD) with associated attachment hardware intended for use with an undefined wheelchair.

This part of ISO 16840 does not apply to the strength of PSDs under crash conditions in a motor vehicle.

This part of ISO 16840 does not apply to PSDs that are designed to fail under certain static, dynamic, or repetitive loads.

NOTE 1 ISO 16840-4 provides test methods and requirements for some PSDs when used as part of a wheelchair seat in a motor vehicle.

NOTE 2 Performance criteria have been established in some of the defined tests. In others, no minimum requirements are currently specified.

NOTE 3 For masses greater than 150 kg or less than 25 kg, appropriate extrapolation of test apparatus dimensions, mounting point separation, etc. are permitted.

NOTE 4 Rigid surrogate test fixtures are utilized to provide a worst-case situation, and consequently this part of ISO 16840 does not test a PSD on a particular wheelchair.

NOTE 5 If one PSD achieves a higher loading at the point of failure than another, it does not necessarily mean that it is better or worse. The type of failure and flexibility of the PSD can be considered as well. The maximum offset distance to the centre of the PSD from the adjacent attachment point can also be considered.

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 554, *Standard atmospheres for conditioning and/or testing — Specifications*

ISO 898-7, *Mechanical properties of fasteners — Part 7: Torsional test and minimum torques for bolts and screws with nominal diameters 1 mm to 10 mm*

ISO 7176-8:1998, *Wheelchairs — Part 8: Requirements and test methods for static, impact and fatigue strengths*

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

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

ISO 16840-2, *Wheelchair seating — Part 2: Determination of physical and mechanical characteristics of devices intended to manage tissue integrity — Seat cushions*