AS/NZS ISO 7176.11:2013
ISO 7176-11:2012

AS/NZS ISO 7176.11:2013

Australian/New Zealand Standard™

Wheelchairs

Part 11: Test dummies

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 23 July 2013 and on behalf of the Council of Standards New Zealand on 5 August 2013.
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The following are represented on Committee ME-067:

Assistive Technology Suppliers Australia
Association of Consultants in Access Australia
Australian Rehabilitation on Assistive Technology
Bus and Coach Association of New Zealand
Consumer Federation Australia
Department of Family and Communities (SA)
Engineers Australia
Independent Living Centres Australia
Medical Aids Subsidy Scheme
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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 7176.11.

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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, to supersede AS 3696.11—1993, *Wheelchairs*, Part 11: *Test dummies*.

The objective of this Standard is to specify requirements for test dummies of any mass greater than or equal to 25 kg, to be used in the evaluation of wheelchairs. This part of ISO 7176 provides formulae that specify the location of the overall centre of mass of test dummies, the masses of the segments that comprise the test dummies and the locations of pivots that connect the segments. It also specifies the characteristics of loading pads that support the segments.

This Standard is identical with, and has been reproduced from ISO 7176-11:2012, *Wheelchairs*, Part 11: *Test dummies*.

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

(a) In the source text 'this part of ISO 7176' 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/NZS ISO
7176 Wheelchairs	7176 Wheelchairs
7176-26 Part 26: Vocabulary	7176.26 Part 26: Vocabulary

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

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INTRODUCTION

When testing wheelchairs it is often necessary to simulate a human occupant. Test dummies designed for motor vehicle crash testing are used where it is appropriate to do so, but they are expensive. A need exists for an affordable alternative. The first edition of ISO 7176-11, published in 1992, specified a set of test dummies that would be suitable for most wheelchair tests. The designs were intended to provide an appropriate total load mass, to approximate the mass distribution of a human occupant, to avoid unrepresentative damage to the wheelchair, to be durable and to be inexpensive to manufacture.

Experience of using the first edition of ISO 7176-11 and related test dummy specifications showed that test dummies did not always provide repeatable results, particularly for static and dynamic stability tests. Several areas for improvement have been identified: to extend the mass range, to enable a test dummy of arbitrary mass to be made, to enable verification of the location of the overall centre of mass and to enable adjustment of the position of the overall centre of mass. This second edition of ISO 7176-11 is intended to provide these improvements.

The ability to measure and adjust the location of the overall centre of mass eliminates the need to specify many aspects of test dummy design. It also allows for the mass of a test dummy to be altered as needed.

The formulae provided in this part of ISO 7176 for the location of the overall centre of mass are based on data and research available to date. It is expected that the range of masses and the mass distribution of wheelchair occupants will change over time. Revisions can be made to this part of ISO 7176 to reflect such changes as and when data becomes available.

AUSTRALIAN/NEW ZEALAND STANDARD

Wheelchairs

Part 11: Test dummies

1 Scope

This part of ISO 7176 specifies requirements for test dummies of any mass greater than or equal to 25 kg, to be used in the evaluation of wheelchairs. This part of ISO 7176 provides formulae that specify the location of the overall centre of mass of test dummies, the masses of the segments that comprise the test dummies and the locations of pivots that connect the segments. It also specifies the characteristics of loading pads that support the segments.

The specified location for the centre of mass is approximately the same as that of a human being of the corresponding mass when seated in a wheelchair, and also, for masses up to 100 kg, when in a standing position in a stand-up wheelchair. This part of ISO 7176 does not attempt to represent the mass distribution of a person with limb atrophy or amputation. This part of ISO 7176 is intended to enable the construction of test dummies that will produce comparable results for stability, performance and durability testing of manual wheelchairs and electrically powered wheelchairs, including scooters.

This part of ISO 7176 also includes informative tables of mass and locations of centre of mass, which are derived from the formulae, corresponding to example test dummy masses up to 300 kg in 25 kg increments.

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7176-26 and the following apply.

3.1
forward location
distance forward from the back support reference plane, measured perpendicular to it

NOTE For the purposes of this document, the back support reference plane is equivalent to the front surface of the test fixture's back support when the test dummy is fitted in the test fixture (see 5.1).

3.2
height
distance upward from the seat reference plane, measured perpendicular to it

NOTE For the purposes of this document, the seat reference plane is equivalent to the upper surface of the test fixture's seat when the test dummy is fitted in the test fixture (see 5.1).