AS 3696.8 (Int)—1991
ISO/DP 7176-8:1989
(Expires 9 December 1993)

Identical to ISO/DP 7176/8 :1989

*EXPIRY DATE HAS BEEN REACHED. STANDARD NO LONGER AVAILABLE (AS DECEMBER 1995)

Interim Australian Standard®

Wheelchairs

Part 8 (Int): Static, impact and fatigue strength tests

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee ME/67, Mobility Appliances for People with Disabilities. It was approved on behalf of the Council of Standards Australia on 25 September 1991 and published on 9 December 1991.

The following interests are represented on Committee ME/67:

ACROD
Attorney-Generals Department
Australian Association of Occupational Therapists
Canberra College of Advanced Education
Commercial Vehicle Industry Association of Australia
Confederation of Australian Industry
Crippled Childrens Association of South Australia
Department of Health, New South Wales
Department of Health, Queensland
Department of the Premier and Cabinet, South Australia
Department of Veterans Affairs
Disability Advisory Council of Australia
Federal Chamber of Automotive Industries
Health Department, Victoria
Institution of Engineers, Australia
Metal Trades Industry Association of Australia
National Committee Independent Living Centres
Paraplegic and Quadriplegic Association of New South Wales
Paraplegic and Quadriplegic Association of Victoria
Royal North Shore Hospital
Royal Perth Hospital
Technical Aid to Disabled
University of Adelaide
University of Melbourne
WorkCover Authority, New South Wales

Additional interests participating in preparation of the Standard:

Paraplegic and Quadriplegic Association of South Australia

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First published as AS 3696.8 (Int)—1991.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY NSW
ISBN 0 7262 7141 1

PREFACE

This Interim Australian Standard was prepared by the Standards Australia Committee for Mobility Appliances for People with Disabilities. It is identical with, and has been reproduced from, ISO/TC 123/SC 1/WG document 485 ISO/DP 7176-8:1989 revised and circulated in December 1990.

Through its subcommittee for wheelchairs, and representation at ISO meetings, the committee has been closely involved in the preparation of the test methods and the minimum performance values set down in this document. Testing of these methods has been in operation for a considerable time, and the methods have reached a stage of development where their publication in an Interim Standard will enable user experience to be contributed towards the eventual adoption of the methods as an Australian Standard.

Because of the need for these test methods to be called up in a proposed Australian Standard for product requirements for wheelchairs, this document is released as an Interim Standard.

For the purposes of this Australian Standard, the ISO text should be modified as follows:

(a) *Spelling* The word 'tire' wherever mentioned, should be replaced by 'tyre'. The word 'caster' should be replaced by 'castor'. The word 'center' should be replaced by 'centre'.

(b) *Clause 9.1 Delete* the clause and *substitute*:
'9.1 Any Class 3 condition as described in Appendix H.'

(c) *Appendix H Delete* the heading and *substitute*:
'Annex H (Normative)
Classes of conditions following testing'.

(d) *Annex N Delete* possible source and foam specification and *substitute*:
'Foam shall be 25 mm thick polyurethane foam. The 40 percent indentation force on deflection of the foam when tested in accordance with AS 2282.8 shall be in the range 350 to 450 N. The value of the apparent density of the foam when tested in accordance with AS 2282.3 shall be in the range 29 kg/m^3 to 31.5 kg/m^3.'

(e) *Annex Q Delete* symbol g and definition, and *substitute*:
'g = gravitational constant = 9.807 m/s^2.'

(f) *Reference* The references to other publications should be replaced by reference to Australian Standards as follows:

Reference to International Standard ISO		*Australian Standard* AS	
6440	Wheelchairs—Nomenclature, terms and definitions	3693	Wheelchairs—Nomenclature, terms and definitions
7930	Wheelchairs—Type classification based on appearance characteristics	3694	Wheelchairs—Type classification based on appearance characteristics
845	Cellular plastics and rubbers—Determination of apparent (bulk) density	2282	Methods for testing flexible cellular polyurethane
		2282.3	Method 3: Determination of apparent density of flexible cellular polyurethane
2439	Polymeric materials, cellular flexible—Determination of hardness (indentation technique)	2282.8	Part 8: Deflection tests for flexible cellular polyurethane

Standards Australia invites comment on this Interim Standard from persons and organizations concerned with this subject. The date of expiry for comment is two years after publication at which time this Interim Australian Standard will either be confirmed, withdrawn or revised in the light of public comment.

During the life of this document the committee will monitor all comment as it is received.

Attention is drawn to the fact that this document is an Interim Australian Standard and should be regarded as a developmental Standard and liable to future alteration.

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 Standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75% approval by the member bodies voting.

International Standard ISO 7176-8 was prepared by Technical Committee ISO/TC 173, Technical systems and aids for disabled or handicapped persons.

The following annexes to this part of the standard are normative:

Annex A Wheel alignment measurements
Annex B Tolerances for wheel alignment measurements
Annex D Direction of application of static test loads
Annex E Recommended minimum performance values
Annex H Classes of failure
Annex J Obstacle and standard slat specification
Annex K Handrim impact load, test apparatus and set up
Annex L Testing checklist
Annex M Standard loading mass
Annex N Foam configuration for curb drop test
Annex P Definition of Drop Height for Loaded Drop Impact Load Test

The following annexes to this part of the standard are informative:

Annex C Loading pad
Annex F Static and impact load test fixtures
Annex G Securing methods for wheelchair during static and impact testing
Annex I Method for determining velocity
Annex O Fore-Aft C.G. Location Measurement
Annex Q Rationale used in determining recommended performance values of static strength tests

ISO 7176 consists of the following parts under the general title Wheelchairs:

- Part 1. Determination of static stability
- Part 2. Determination of dynamic stability of electric wheelchairs
- Part 3. Determination of the efficiency of brakes
- Part 4. Determination of energy consumption of electric wheelchairs
- Part 5. Determination of overall dimensions, mass and turning space
- Part 6. Determination of maximum speed, acceleration and retardation of electric wheelchairs
- Part 7. Seating dimensions
- Part 8. Static, impact and fatigue strength tests for wheelchairs
- Part 9. Climatic tests for electric wheelchairs
- Part 10. Determination of the obstacle climbing ability of electric wheelchairs
- Part 11. Test dummies
- Part 13. Determination of coefficient of friction of test surfaces
- Part 14. Power and controls
- Part 15. Requirements for information disclosure, documentation and labelling
- Part 16. Determination of burning behavior

CONTENTS

..heelchairs

Part 8: Static, impact and fatigue strength tests

MANUAL WHEELCHAIRS

1 Scope

This part of the ISO 7176 specifies the following for manual and powered wheelchairs:

1.1 Disclosed values

e test methods to verify manufacturers' disclosed values of static, __pact, and fatigue strength.

1.2 Recommended minimum values

The test methods to determine recommended minimum performance values of static, impact, and fatigue strength.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7176. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7176 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

) 6440:1985,	Wheelchairs - Nomenclature, terms and definitions.
ISO 7930:1986,	Wheelchairs - Type classification based on appearance characteristics
ISO 7176-11:1990,	Wheelchairs - Test dummies.
ISO 7176-15:1990,	Requirements for information disclosure, documentation and labeling
ISO 845:1988,	Cellular rubber and plastics - Determination of repair density
ISO 2439:1980,	Polymeric Materials, Cellular flexible - Determination of hardness (indentation technique)

3 Definitions

r the purposes of this part of ISO 7176, the definitions given in) 6440 apply.