BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

व्हीलचेयर
भाग 28 सीढ़ी चढ़ने वाले उपकरणों के लिए आवश्यकताएँ और परीक्षण विधियाँ

Draft Indian Standard

Wheelchairs
Part 28 Requirements and test methods for stair-climbing devices

[ICS 11.180.10]

Artificial Limbs, Rehabilitation Appliances and Equipment for the Persons with Disability Sectional Committee, MHD 09	Last date for comments: 5 June, 2024

NATIONAL FOREWORD

(*Adoption clause will be added later*)

The text of ISO Standard has been approved as suitable for publication as an Indian Standard Without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 7176-l Wheelchairs - Part 1: Determination of static stability.	IS 18651 (Part 1): 2024/ISO 7176-1: 2014 Wheelchairs Part 1 Determination of static stability	Identical
ISO 7176-2 Wheelchairs - Part 2: Determination of dynamic stability of electric wheelchairs.	IS 18651 (Part 2) : 2024/ISO 7176-2 : 2017 Wheelchairs Part 2 Determination of dynamic stability of electrically powered wheelchairs	Identical

ISO 7176-3 Wheelchairs - Part 3: Determination of efficiency of brakes.	IS 18651 (Part 3) : 2024/ISO 7176-3 : 2012 Wheelchairs Part 3 Determination of effectiveness of brakes	Identical
ISO 7176-4 Wheelchairs - Part 4: Determination of energy consumption of electric wheelchairs and scooters - Theoretical range.	IS 18651 (Part 4) : 2024/ISO 7176-4 : 2008 Wheelchairs Part 4 Energy consumption of electric wheelchairs and scooters for determination of theoretical distance range	Identical
ISO 7176-5 Wheelchairs - Part 5: Determination of overall dimensions, mass and turning space.	IS 18651 (Part 5): 2024/ISO 7176-5 : 2008 Wheelchairs Part 5 Determination of dimensions mass and manoeuvring space	Identical
ISO 7176-6 Wheelchairs - Part 6: Determination of maximum speed, acceleration and retardation of electric wheelchairs.	IS 18651 (Part 6) : 2024/ISO 7176-6 : 2018 Wheelchairs Part 6 Determination of maximum speed of electrically powered wheelchairs	Identical
ISO 7176-7 Wheelchairs - Part 7: Method of measurement of seating and wheel dimensions.	IS 18651 (Part 7) : 2024/ISO 7176-7 : 1998 Wheelchairs Part 7: Measurement of seating and wheel dimensions	Identical
ISO 7176-8 Wheelchairs - Part 8: Requirements and test methods for static, impact and fatigue strengths.	IS 18651 (Part 8) : 2024/ISO 7176-8 : 2014 Wheelchairs Part 8 Requirements and test methods for static impact and fatigue strengths	Identical
ISO 7176-9 Wheelchairs - Part 9: Climatic tests for electric wheelchairs.	IS 18651 (Part 9) : 2024/ISO 7176-9 : 2009 Wheelchairs Part 9 Climatic tests for electric wheelchairs	Identical
ISO 7176-10 Wheelchairs - Part 10: Determination of obstacle-climbing ability of electric wheelchairs.	IS 18651 (Part 10) : 2024/ISO 7176-10 : 2008 Wheelchairs Part 10 Determination of obstacle-climbing ability of electrically powered wheelchairs	Identical
ISO 7176-11 Wheelchairs - Part 11: Test dummies.	IS 18651 (Part 11) : 2024/ISO 7176-11 : 2012 Wheelchairs Part 11 Test dummies	Identical
ISO 7176-13 Wheelchairs - Part 13: Determination of coefficient of friction of test surfaces.	IS 18651 (Part 13) : 2024/ISO 7176-13 : 1989 Wheelchairs Part 13 Determination of coefficient of friction of test surfaces	Identical

ISO 7176-14 Wheelchairs - Part 14: Power and control systems for electric wheelchairs – Requirements and test methods.	IS 18651 (Part 14) : 2024/ISO 7176-14 : 2022 Wheelchairs Part 14 Power and control systems for electrically powered wheelchairs and scooters Requirements and test methods	Identical
ISO 7176-15 Wheelchairs — Part 15: Requirements for information disclosure, documentation and labelling	IS 18651 (Part 15) : 2024/ISO 7176-15 : 1996 Wheelchairs Part 15 Requirements for information disclosure documentation and labelling	Identical
ISO 7176-19 Wheelchairs — Part 19: Wheeled mobility devices for use as seats in motor vehicles	IS 18651 (Part 19) : 2024/ISO 7176-19 : 2022 Wheelchairs Part 19 Wheelchairs for use as seats in motor vehicles	Identical
ISO 7176-21:2009, Wheelchairs — Part 21: Requirements and test methods for electromagnetic compatibility of electrically powered wheelchairs and scooters, and battery chargers	IS 18651 (Part 21) : 2024/ISO 7176-21 : 2009 Wheelchairs Part 21 Requirements and test methods for electromagnetic compatibility of electrically powered wheelchairs and scooters and battery chargers	Identical
ISO 7176-22 Wheelchairs — Part 22: Set-up procedures	IS 18651 (Part 22) : 2024/ISO 7176-22 : 2014 Wheelchairs Part 22: Set-up procedures	Identical
ISO 7176-26, Wheelchairs — Part 26: Vocabulary	IS/ISO 7176-26 : 2007 Wheelchairs: Part 26 vocabulary	Identical
ISO 14971, Medical devices — Application of risk management to medical devices	IS/ISO 14971: 2019 Medical devices - Application of risk management to medical devices (*first revision)*	Identical

The technical committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 3880-1	Building construction — Stairs — Vocabulary
ISO 7176-16	Wheelchairs — Part 16: Resistance to ignition of upholstered parts – Requirements and test methods

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test shall be rounded off in accordance with **IS 2: 2022** 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be same as that of the specified value in this standard.

Introduction

This part of ISO 7176 was written in response to the need for common terminology in the field of stair-climbing devices, to give a means of evaluating important safety features, and to establish a means of qualifying and quantifying the performance of stair-climbing devices under the various conditions and environments encountered in their operation. It allows occupants and manufacturers to compare the pertinent safety and utility issues of all functions and features of a given stair-climbing device.

The tests specified in this part of ISO 7176 are used to gather comparative information about factors relating to the safety and performance of a stair-climbing device while in climbing mode on stairs and in climbing mode or crawling mode on landings, as well as in driving mode. They include identification of suitable operating environments for each stair-climbing device and indications of various performance criteria in climbing mode for operations on stairs and on driving surfaces.

This part of ISO 7176 specifies tests for the "reference configuration" of the stair-climbing device. Since some stair-climbing devices have adjustable components and/or alternative parts, testing in different configurations may be needed to determine whether a given variation conforms to this part of ISO 7176.

Other parts of ISO 7176 might be applicable to stair-climbing devices that can also be used as wheelchairs. All technical aspects which are relevant for wheelchairs and covered in ISO 7176 are adapted, modified and/or extended for the various needs of the different operational modes of a stair-climbing device.

Scope

This part of ISO 7176 is applicable to stair-climbing chairs and stair-climbing wheelchair carriers where the stair-climbing device climbs backwards up the stairs, with the occupant facing downstairs, and climbs forwards down the stairs with the occupant also facing downstairs.

This part of ISO 7176 is applicable to stair-climbing devices which are intended for the transport of adults and those intended for the transport of children. It is not applicable to stair-climbing devices which are intended to be operated by children as operating occupants or assistants.

This part of ISO 7176 specifies requirements and test methods for electrically powered stair-climbing devices. It is not applicable to manually powered stair-climbing devices.

NOTE 1 Some clauses in this part of ISO 7176 might be useful for testing manually powered stair-climbing devices.

This part of ISO 7176 specifies tests to demonstrate the stair-climbing device's ability to perform safely on stairs with a pitch of 35°, or higher if declared by the manufacturer. It also includes ergonomic, labelling and disclosure requirements.

NOTE 2 When the stair-climbing device is tested in driving mode as specified this part of ISO 7176, the device need not be tested a second time for the same aspects as a wheelchair.

NOTE 3 Some requirements apply only for a specified range of rated loads.

NATIONAL ANNEX A

(National Foreword)

A-1 BIS CERTIFICATION MARKING

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the Bureau of Indian Standards Act, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

The technical content of the document has not been enclosed as it is identical with the corresponding ISO standard. For details, please refer to ISO 7176-28:2012 or kindly contact:

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