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Draft Indian Standard

Portable Ramps – Specification

Artificial Limbs, Rehabilitation Appliances and Equipment for the Persons with Disability Sectional Committee, MHD 09

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FOREWORD

(Formal clauses will be added later)

A portable ramp is a moveable sloping surface that bridges a limited gap of two or higher levels. The purpose of using portable ramps is to assist individuals with walking difficulties, such as wheelchair users, and those pushing strollers, carts, or other wheeled objects, to move up and down stairs. Portable ramps may also be used in rough terrain or for entering/leaving cars. They can be carried and transported, providing accessibility to buildings, rough terrain, or vehicles for persons with walking impairments.

Portable ramps are used to enable:

a. Access to, or movement around, home or other buildings (generally upto two steps).
b. Access to a wheelchair accessible vehicle for a person in a wheelchair.
c. Assistance with putting a mobility device into a vehicle (without the user in the wheelchair).

Portable ramps used for wheelchairs are available in a wide range of designs, materials, and configurations. The needs of wheelchair users and caregivers should be accommodated for selection of the ramps with the appropriate combination of features. The ease of use and portability of the ramps are influenced by size and mass and also by the presence of handles, the option for folding, and the inclusion of locking mechanisms.

Various types of Portable Ramps available are:

1. Folding,
2. Telescopic,
3. Roll-up,
4. Modular, and
5. Threshold Ramps

In the preparation of this standard, assistance has been derived from ASTM E303-22 *Standard test method for measuring surface frictional properties using the British Pendulum Tester* for slip-resistance testing of the ramp surface.

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 or analysis 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.

1 SCOPE

1.1 This standard specifies the requirement for Portable ramps for wheelchair users, as well as people pushing strollers, carts, or other wheeled objects, to more easily access steps, buildings, and other transportation systems.

1.2 This standard is applicable to portable ramps used for people with a range of mobility problems using powered or manual wheelchairs, mobility aids, older people, and children on with or without assistance of a caregiver to improve freedom of movement around a variety of environments, including the home, place of work, or local community.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS No.	*Title*
IS 18560: 2024/ISO 9999:2022	Assistive products – Classification and terminology

3 TERMS AND DEFINITIONS

3.1 Portable Ramp

As per IS 18560, *portable ramps* are moveable sloping surfaces that bridge a limited gap between two levels.

NOTE- A variety of portable ramps are available in present times, depending on the environment and applications, like folding, telescopic, threshold, etc.

3.2 Folding Ramp

A folding ramp is a type of ramp that can be folded for easy transport and storage.

3.3 Telescopic Ramp

A telescopic ramp is a ramp consisting of sections that slide within each other to adjust length.

3.4 Roll-Up Ramp

A ramp made from slats connected by flexible hinges, allowing it to be rolled up is a Roll-up ramp.

3.5 Modular Ramp

A modular ramp is composed of multiple sections that can be assembled in various configurations.

3.6 Threshold Ramp

A small ramp which is designed to bridge minor height differences at doorways or similar transitions is a threshold ramp.

4 MATERIAL

4.1 The ramp shall be light-weight, made of aluminium and shall have enough strength to ensure the rated load capacity. Fibreglass may be used for increasing the strength of ramp.

4.2 The entire walking surface is shall be covered with anti-skid rubber sheet or slip-resistant tapes with thickness of 3 mm to 4 mm.

5 GENERAL REQUIREMENTS

5.1 The ramp shall be constructed from durable, weather-resistant materials suitable for indoor as well as outdoor use.

5.2 Load Capacity

The ramp shall support sufficient weight to accommodate various mobility devices and users. It shall be able to bear a maximum load of up to and including 300 kg (including a wheelchair along with the user).

5.3 Weight of the ramp

The ramp shall be light in weight. The weight of the ramp shall not be more than 20 kg.

5.4 Length of the ramp

The full length of the ramp shall be at least 8 times of the intended height of the steps/levels to be covered.

5.5 Surface

The ramp surface shall be non-slip to ensure safety in all weather conditions. As per **4.2**, the use of anti-skid tape, deck grip, or textured aluminium rubber may be used to ensure slip-resistance. Wool felt disc may be used for polishing the surface of the aluminium.

5.6 Safety Edges

The ramp shall have raised edges or side rails to prevent wheelchairs or mobility devices from rolling-off from the sides of the ramp. The edges shall be raised with a height of 4 cm to 5 cm.

5.7 Ramp ends

The ramp ends shall be shaped to prevent sliding. They shall be angled for smooth transition between the surfaces.

6 FINISH

6.1 The materials for finish shall be non -toxic. All sharp edges of the portable ramp parts shall be smoothened manually or with machine, the prolife flanges of the portable ramp shall be round and shaped well (inner edge turned down). The anti-skid sheet shall have good finishing.

6.2 The ramp shall be assessed for general finish e.g. paint imperfections, metal burrs, and sharp edges, length and capacity for wheelchair and caregiver access to the vehicle; capacity

to fold, carry, and store, weight and dimensions. The ease of handling & clarity of written instructions shall also be checked.

7 TESTS

7.1 Load Testing

For test preparation, place the ramp on a stable, flat surface. Increased weights are applied gradually on the middle section of the ramp, up to the maximum load capacity. The ramp shall be monitored closely during weight application for any signs of deformation, bending, or structural failure. The maximum weight that the ramp can support without experiencing any damage shall be documented.

7.2 Slip Resistance Testing

For slip resistance test, a British Pendulum Tester (BPT) shall be used to measure the slip resistance of floor surfaces under various conditions: dry, wet (after wetting the ramp surface), and icy (after applying ice or a slippery substance).

The following procedure shall be carried out for measurement of slip resistance:

a) Thoroughly clean the surface to remove any debris.

b) Calibrate the Pendulum Tester to ensure accurate readings.

c) Place the BPT on the floor, making sure it is stable and levelled, and align it so the rubber slider will make full contact with the test surface when the pendulum swings.

d) Lift the pendulum arm to its starting position, usually marked on the device, and release it to let the pendulum swing down and contact the test surface.

e) Ensure the slider makes consistent contact and the pendulum arm moves freely.

f) Note the reading on the scale where the pendulum arm stops after making contact, and repeat this process at least five times at different spots within the test area to ensure consistency.

g) Record each reading, calculate the average, and compare the average value with the recommended slip resistance values using the typical British Pendulum Number (BPN) scale:

   i. BPN < 25: High slip potential

   ii. BPN 25-35: Moderate slip potential

   iii. BPN > 35: Low slip potential

The recommended slip resistance values for portable ramps shall be as follows:

i. For dry conditions: BPN ≥ 36 and

ii. For wet or icy conditions: BPN ≥ 40

7.3 Durability Testing

Simulate repeated use by applying and removing weights or using a mechanical device to mimic walking or wheeling over the ramp for 10 times, while monitoring for signs of wear and tear, structural integrity issues, and surface degradation.

7.4 Stability Testing

The ramp is placed in its designated position, ensuring it is correctly aligned and securely fastened. Different forces are applied to simulate various usage scenarios:

1. Place a weight of 300 kg at the centre of the ramp to represent the maximum user weight standing on it;
2. Push with 150 kg of force at different points along the ramp to simulate sideways pressure, and apply 225 kg of force along the slope of the ramp to mimic the weight distribution of a user walking up or down.
3. Throughout testing, observe closely for any signs of movement, slipping, or instability. Evaluate the ramp's performance to ensure it remains stable without shifting or sliding during use.

8 MARKING

8.1 The ramp shall be marked with the following information:

a) Manufacturer’s name

b) Contact information

c) Country of origin.

8.2 Marking of Load Capacity

The maximum load capacity shall be clearly indicated on the ramp.

8.3 Usage Instructions

Clear and concise instructions for safe use shall be provided with the ramp.

8.4 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.

9 PACKAGING AND LABELLING

9.1 Protective Packaging

The ramp shall be packaged in protective materials to prevent damage during transport and storage.

9.2 Labelling

The packaging shall include clear labelling indicating the type of ramp, manufacturer, and any handling instructions.

9.3 Instruction Manual

Each ramp shall include an instruction manual with guidelines for assembly, use, maintenance, and safety precautions.

9.4 Accessibility sign

The ramp shall be marked with the accessibility sign as per **Fig. 1.**

FIG 1. ACCESSIBILITY SIGN