IS 4184 (1967): steel wheel barrows (with two wheels) [MED 7: Mechanical Engineering]

IS : 4184-1967
(Reaffirmed 2012)

Indian Standard

SPECIFICATION FOR STEEL WHEELBARROWS (WITH TWO WHEELS)

(Third Reprint DECEMBER 1993)

UDC 621.86.629:411.312

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *January* 1968

AMENDMENT NO. 1 FEBRUARY 1980
TO
IS : 4184-1967 SPECIFICATION FOR STEEL WHEELBARROWS (WITH TWO WHEELS)

Alterations

(*Page* 4, *clause* **3.1**, *Line* 2) — Substitute MS : 1079-1973*' *for* MS : 1079-1963*'.

(*Page* 4, *clause* **3.2.1**) — Substitute ' IS : 1977-I975† and IS : 226-1975‡ *for* 'IS : 1977-1962† and IS : 226-1962‡'.

(*Page* **4**, *clause* **3.2.2**) — Substitute 'IS : 1148-1973§' *for* 'IS : 1148-1964§'.

(Page 4, *clause* **3.3**, *lines* 2 *and* 3) — Substitute MS : 1239 (Part I)-1973¶ *for* 'IS : 1239-I964¶' appearing in these two lines.

(Page 4, *clause* **3.4**, *line* 2) — Substitute 'grade FG 200 of LS : 210-1978|| *for* 'grade 20 of IS : 210-1962||'.

(*Page* 4, *foot-notes*) — Substitute the following for the existing foot-notes:

'*Specification for hot rolled carbon Heel sheet and strip (*third revision*).
†Spccification for structural steel (ordinary quality) (*second revision*).
‡Specification for structural steel (standard quality) *(fifth revision*).
§Specification for hot rolled steel rivet bars (up to 40 mm diameter) for structural purposes (*second revision*).
¶Specification for mild steel tubes: Part I Mild steel tubes (*third revision*).
||Specification for grey iron castings (*third revision*).'

(*Page* 8, *clause* **8.2**, *line* 5) — Substitute ' IS : 226-1975* ' *for* ' IS : 226-1962* '.

(*Page* 8, *clause* **10.1**, *line* 2) — Substitute ' IS : 158-I968‡ ' *for* ' IS : 158-1965‡ '.

(*Page* 8, *foot-notes with* '*' *and* '‡' *marks)* — Substitute the following for the existing foot-notes:

'*Specification for structural steel, standard quality (*fifth revision*).
‡Specification for ready mixed paint, brushing, bituminous, black, lead-free acid, alkali, water and heat resisting, for general purposes (*second revision*).'

(UDG 28)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR STEEL WHEELBARROWS (WITH TWO WHEELS)

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Indian Standard

SPECIFICATION FOR STEEL WHEELBARROWS (WITH TWO WHEELS)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 24 July 1967, after the draft finalized by the Construction Plant and Machinery Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Wheelbarrow is the basic equipment put to common use for transporting materials at any construction job. It should be of robust construction to give satisfactory service over a long period and the design of its shape and size should ensure smooth running and ease of handling. This standard lays down requirements for shape, size, materials and fabrication of steel wheelbarrows (with two wheels) for general use on construction works, and is intended to provide guidance to the users as well as the manufacturers. Steel wheelbarrows of single-wheel type are covered in IS : 2431-1963*.

0.3 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices followed in the field in this country.

0.4 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: 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down requirements for dimensions, materials, construction and finish of steel wheelbarrows (with two wheels) suitable for use on the building and civil engineering works.

*Specification for steel wheelbarrows (single-wheel type).
†Rules for rounding off numerical values *(revised)*.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Body — Body of the wheelbarrows consists of the tray or bin only.

2.2 Chassis — The structural frame which supports the body, comprising all the parts of the wheelbarrows except the body, wheel and axle.

3. MATERIALS

3.1 Steel Sheet — Steel sheets shall be not less than 1.60 mm in thickness and shall conform to IS: 1079-1963*.

3.2 Steel Sections Bars and Rivets

3.2.1 Steel sections and bars shall conform to IS: 1977-1962† and IS:226-1962‡.

3.2.2 Rivet bars shall conform to IS: 1148-1964§.

3.3 Steel Tubes — Steel tubes, if thev are to be drilled shall be medium tubes conforming to IS: 1239-1964¶. If they are not to be drilled, light tubes complying with IS: 1239-1964¶, may be used.

3.4 Grey Iron Castings — Grey iron castings shall conform to grade 20 of IS: 210-1962||.

4. CAPACITY

4.1 The wheelbarrows shall be of the following nominal capacities:

75 litres
85 „
110 „
140 „

4.1.1 These nominal capacities shall be based on the capacity of wheelbarrows filled with sand which is slightly heaped.

4.2 The wheelbarrows shall withstand a proof load of 250 kg for 75 litre capacity, 300 kg for 85 litre capacity, 370 kg for 110 litre capacity and 470 kg for 140 litre capacity without any permanent deformation of the members. The proof load shall be applied by filling the body of wheelbarrow with a suitable material.

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*Specification for hot rolled carbon steel sheet and strip *(revised)*.
†Specification for structural steel (ordinary quality).
‡Specification for structural steel (standard quality) *(third revision)*.
§Specification for rivet bars for structural purposes *(revised)*.
¶Specification for mild steel tubes and tubulars *(revised)*.
||Specification for grey iron castings *(revised)*.

5. BODY

5.1 Construction — The body shall be either cut from a single sheet of steel, the joints being secured by riveting or welding, or it may be solid-drawn pressing from a single sheet. If joints are secured by riveting, the rivets shall be of diameter not less than 6 mm and shall be placed at a spacing of not more than 10 cm.

5.1.1 The body shall have top edge reinforced by one of the following methods:

a) The edge rolled over a steel rod of not less than 8 mm diameter in order to form a bead and to retain the rod.

b) A mild steel band not less than 20×5 mm in cross-section closely riveted or welded to the outside of top edges. If riveted, the rivets shall be of diameter not less than 6 mm and shall be placed at each end of the strip and at intermediate points not more than 15 cm apart.

Additional reinforcement shall be provided at both front corners by welding both edges of the band to the body sheeting, or by additional rivets.

5.1.2 The body shall be fixed to the chassis by welding or with black mild steel bolts with cup heads, round necks and square or hexagonal nuts, the bolts being of not less than 8 mm diameter.

5.2 The body shall be so designed that the position of centre of gravity aids the forward motion of the wheelbarrow when in use (filled to its maximum nominal capacity) with normal inclination to the horizontal without causing spillage of the material.

5.2.1 The design and dimensions shall be such that when the body is fixed to the chassis the liquid capacity is not less than 30 litres for 75-litre size, 35 litres for 85-litre size, 55 litres for 110-litre size and 70 litres for 140-litre size. This capacity shall be determined by standing the barrow on a level surface and filling it with water. The handles of the barrow shall then be raised until the undersides of the ends of the handles are 75 cm above the level of the level surface on which the wheel is resting; the water remaining, after raising the body to this position, shall then be measured.

5.3 In order to facilitate the use of spare bodies with existing frames, they shall be supplied without fixing holes unless otherwise ordered.

6. CHASSIS

6.1 The chassis frame shall consist either of a single length of tube of 25 mm nominal bore or any other suitable steel section such as flat of

size 30×6 mm or angle or channel section of equivalent strength, suitably bent to form a support for the wheel and the body.

6.2 The legs of the chassis shall be formed as part of the tube or other steel section used for the construction of frame or shall consist of separate length of tube or steel section similar to that used for the frame, bent to form a bow and welded to the main frame.

6.3 The frame shall be reinforced with two mild steel bars, each not less than 30×5 mm in cross-section and arranged to span between the chassis frame at the handle end as well as the wheel end of the body, with their ends closely formed round or welded to the frame. Each leg shall be braced by a mild steel bar not less than 30 × 6 mm in cross-section, closely formed round the bottom of the leg and arranged to provide an intermediate support for the body. Alternately an X type bracing of 25×6 mm steel strip and spaning between the two legs may be provided.

6.3.1 Two front steel braces, not less than 25×6 mm in cross-section shall be fixed between the wheel ends of the body and the chassis frame or the chassis frame shall be suitably bent to provide support to the body at the wheel ends. The arrangement shall, however, not prevent tipping of the wheelbarrow over its wheels, when so required by the operator to empty its contents.

6.4 The underside of the handle ends shall be not less than 50 cm and the top edge of the body not more than 60 cm above the ground level when the legs are resting on the ground.

6.5 The overall width of the handles shall be not less than 50 cm and not greater than 55 cm. The ends of the handles shall be provided with firm comfortable and non-slip grips.

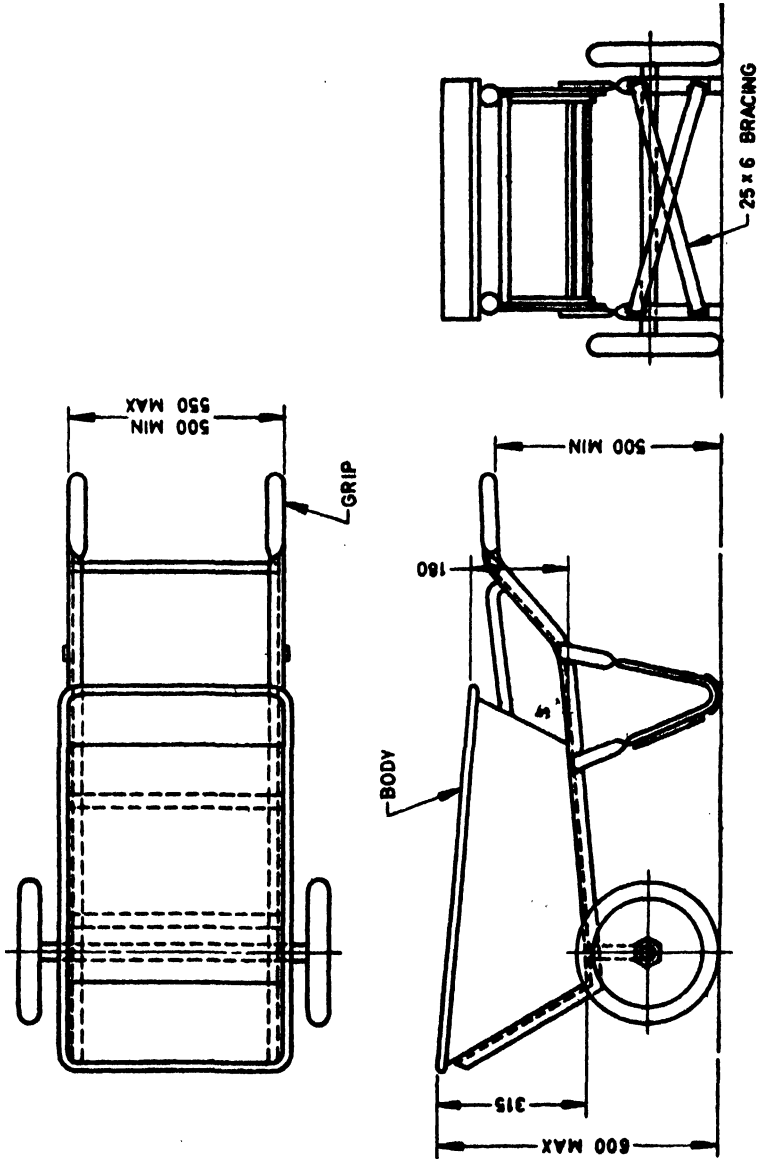
6.6 The shape and construction of the chassis and body shall ensure stability of the wheelbarrow when the legs are resting on ground or when the wheelbarrow is in motion under normal working conditions.

6.7 A typical design of the wheelbarrow (with two wheels) is given in Fig. 1.

7. WHEELS

7.1 The wheels shall be constructed of mild steel or cast iron and shall be of disk type or any other suitable design to ensure adequate strength. The wheels shall be fitted with metal rims, or solid or cushioned rubber tyres.

7.2 The diameter of the wheels shall be not less than 300 mm and the nominal width of the tyre shall be not less than 50 mm.



All dimensions in millimetres

FIG. 1 TYPICAL SKETCH OF WHEELBARROW (WITH TWO WHEELS)

8. AXLE

8.1 The axle shall be fixed to the chassis frame and the bearings shall be located inside the wheel hubs which will revolve over the axle.

8.2 The axle shall be not less than 25 mm in diameter and the bearing length shall be not Jess than 25 mm at each end. The journal portion of the axle shall be machined to appropriate tolerances and the allowance, and the surface finished to ensure uniform bearing contact. The material for axle shall conform to IS: 226-1962* if bronze bearing bushes are used, and to appropriate grade of wrought steel, such as C 40 of IS: 1570-1961†, if cast iron bearings are used *(see* **9.1**).

9. BEARINGS

9.1 The bearings shall be so designed that there is no side play in the movement of the wheels. The bearings shall consist of grey iron castings or pressings, or bronze bearing bushes or any other suitable bearings of equivalent properties.

9.2 The internal diameter of bore of the bearing shall be such that the clearance between bearing and the axle is not more than 0.5 mm.

9.3 The bearing walls shall be of adequate thickness preferably not less than 5 mm to avoid premature wear and giving way of bearing under load.

9.4 Adequate arrangements shall be provided to facilitate proper lubrication of bearings.

10. FINISH

10.1 The metal parts shall be finished with two coats of black bituminous paint conforming to IS: 158-1965‡.

10.2 When so specified by the purchaser the metal parts may have galvanized or any other finish. The galvanizing shall comply with the requirements of the appropriate Indian Standards.

11. MARKING

11.1 The capacity of the wheelbarrow shall be marked on each wheelbarrow. Each wheelbarrow may be marked with the name of the manufacturer or his trade-mark, unladen weight of the wheelbarrow and the year of manufacture.

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*Specification for structural steel, standard quality *(third revision)*.

†Schedules for wrought steels for general engineering purposes.

‡Specification for ready mixed paint, brushing, bituminous, black, lead-free, acid, alkali,, water and heat resisting, for general purposes *(revised)*.

11.1.1 The wheelbarrows may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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R14 Yudhister Marg, C Scheme, JAIPUR 302005	6 34 71
117/418 B Sarvodaya Nagar, KANPUR 208005	21 68 76
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