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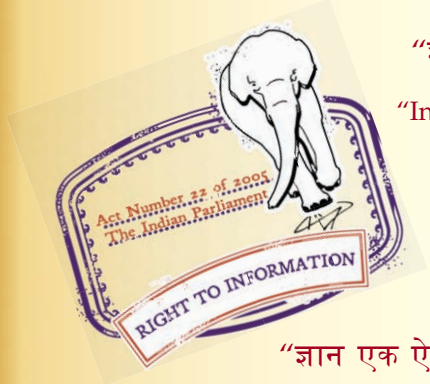
IS 2431 (1963): Spcification for steel wheel barrows (single barrow type) [MED 7: Material Handling Systems and Equipment]



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"Knowledge is such a treasure which cannot be stolen"

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IS : 2431 - 1963
(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR STEEL WHEELBARROWS (SINGLE-WHEEL TYPE)

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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August 1963

Indian Standard

SPECIFICATION FOR STEEL WHEELBARROWS (SINGLE-WHEEL TYPE)

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Indian Standard

SPECIFICATION FOR STEEL WHEELBARROWS (SINGLE-WHEEL TYPE)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 July 1963, after the draft finalized by the Construction Plant and Machinery Sectional Committee had been approved by the Building 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 of single-wheel type for general use on construction works, and is intended to provide guidance to the users as well as the manufacturers.

0.3 The Sectional Committee responsible for the preparation of this standard has taken into consideration the views of producers, consumers and technologists and has related the standard to the manufacturing and trade practices followed in the country in this field. Due weightage has also been given to the need for international co-ordination among standards prevailing in different countries of the world. These considerations led the Sectional Committee to derive assistance from B.S.1786 : 1951 Steel Wheelbarrows issued by British Standards Institution.

0.4 Wherever a reference to any Indian Standard appears in this specification, it shall be taken as a reference to its latest version.

0.5 Metric system has been adopted in India and all quantities and dimensions mentioned in this standard have been given in this system.

0.6 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 : 2-1960 Rules for Rounding Off Numerical Values (*Revised*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

0.7 This standard is intended chiefly to cover the technical provisions relating to steel wheelbarrows, single-wheel type, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard lays down requirements for dimensions, materials, construction and finish of steel wheelbarrows of the single-wheel type suitable for use on the building and civil engineering works.

2. TERMINOLOGY

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

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

2.2 Chassis — The structural frame which supports the body, comprising all the parts of the wheelbarrow 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 : 1079-1958 Specification for Light Gauge Structural Quality Hot Rolled Carbon Steel Sheet and Strip.

3.2 Steel Sections, Bars and Rivets

3.2.1 Steel sections and bars shall conform to*IS : 1977-1962 Specification for Structural Steel (Ordinary Quality) or †IS : 226-1962 Specification for Structural Steel (Standard Quality) (*Third Revision*).

3.2.2 Rivet bars shall conform to‡IS : 1148-1957 Specification for Rivet Bars for Structural Purposes.

3.3 Steel Tubes — Steel tubes, if they are to be drilled, shall be medium tubes conforming to§IS : 1239-1958 Specification for Mild Steel Tubes and Tubulars. If they are not to be drilled, light tubes complying with §IS : 1239-1958 may be used.

3.4 Grey Iron Castings — Grey iron castings shall conform to Grade 20 of †IS : 210-1962 Specification for Grey Iron Castings (*Revised*).

4. CAPACITY

4.1 The wheelbarrows shall be of the following nominal capacities:

60 litres
85 litres

*Second revision in 1975.
†Since revised.
‡Second revision in 1973.
§Since revised and split into various parts.

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

4.2 The wheelbarrows shall withstand a proof load of 200 kg for 60 litre capacity and 300 kg for 85 litre capacity without any permanent deformation of the members.

5. BODY

5.1 Construction — The body shall be either cut and folded from a single sheet of steel, the joints being secured by riveting or welding, or it may be solid-drawn pressing from 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 mm × 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.

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 bolt being of not less than 8 mm diameter.

5.2 Spare Bodies — Spare bodies shall be supplied without fixing holes unless otherwise ordered.

6. CHASSIS

6.1 The design and dimensions of the frame shall be such that the distance between the centre of the axle and the nearest point of the body does not exceed 23 cm, and the distance from the centre of the axle to the end of the handles is not less than 120 cm and not greater than 135 cm.

6.2 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.

6.3 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.

6.4 The frame shall be reinforced with a mild steel bar not less than 30 × 5 mm in cross-section which shall be arranged to span between the chassis frame at the handle end of the body, with its ends closely formed round 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. Two front braces of not less than 25 × 6 mm in cross-section shall be fixed between the wheel end of the body and the chassis frame. If the leg bracing is of 'X' type then 25 × 6 mm strip may be substituted.

6.5 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.

6.6 The overall width of the handles shall be not less than 53 cm and not greater than 55 cm. The ends of the handles shall be provided with firm, comfortable and non-slip grips.

6.7 A typical design of the wheelbarrow, single-wheel type is given in Fig. 1.

7. WHEEL

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

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

8. AXLE

8.1 The axle shall be either fixed to the chassis frame, in which case the bearing shall be located inside the wheel hub which will revolve over the axle; or the axle shall revolve between the bearings, there being no relative motion between the axle and the wheel and each bearing being secured to the chassis frame by two bolts of not less than 8 mm diameter. In the later case, the bearings shall be so designed that the axle cannot be removed from them without first dismantling the bearings.

8.2 The axle or spindle shall be not less than 25 mm in diameter and the bearing length shall be not less than 25 mm at each end. The journal portion of the axle shall be machined to appropriate tolerances and allowance, and the surface finished to ensure uniform bearing contact. The material for axle shall conform to *IS : 226-1962 Specification for Structural Steel (Standard Quality) (*Third Revision*), if bronze bearing bushes are used, and to appropriate grade of wrought steel, such as C 40 of IS : 1570-1961 Schedule for Wrought Steels for General Engineering Purposes, if cast iron bearings are used (*see* **9.1**).

*Since revised

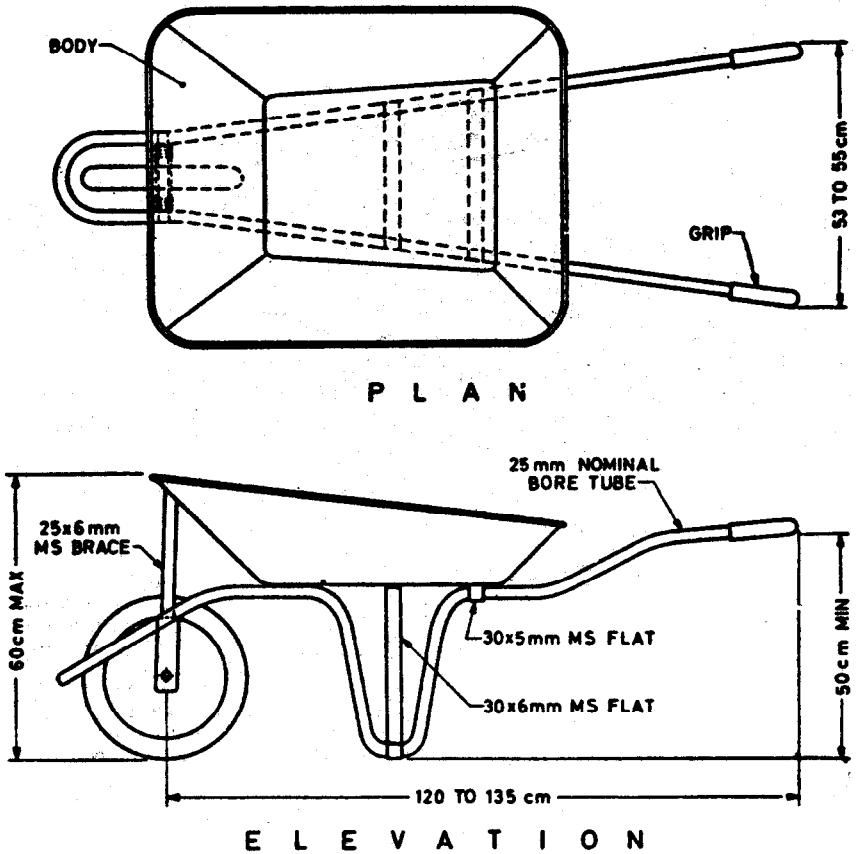

FIG. 1 TYPICAL SKETCH OF WHEELBARROW (SINGLE-WHEEL TYPE)

9. BEARINGS

9.1 The bearings shall be so designed that there is no side play in axle movement or movement of the wheel. 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 : 158-1950 Specification for Ready Mixed Paint, Brushing, Bituminous, Black, Lead-Free, Acid, Alkali, Water and Heat Resisting, for General Purposes.

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

11.1.1 The wheelbarrow may also be marked withthe ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI 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 ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Conversion*
Force	newton	N	1 N = 1 kg. 1 m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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