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IS 12466 (2012): Builder's Hoist - General Requirements
[MED 18: Construction Plant and Machinery]



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भारतीय मानक
बिल्डर हेतु हॉस्ट — सामान्य अपेक्षाएँ
(पहला पुनरीक्षण)

Indian Standard

BUILDER'S HOIST — GENERAL REQUIREMENTS
(*First Revision*)

ICS 53.020.99; 91.080.01

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Construction Plant and Machinery Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1988. The experience gained in implementation of the standard and revision/superseding of reference standards have necessitated this revision. With the changing environment in the building industry, need for better and safe equipment has emerged. This standard has been formulated in order to guide the industry in the design and manufacture of builder's hoist for hoisting building material.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the results of a test or analysis, 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.

Indian Standard

BUILDER'S HOIST — GENERAL REQUIREMENTS

(*First Revision*)

1 SCOPE

This standard lays down requirements for capacity, construction, safety, performance and testing of single and double platform hoists with or without tilting bucket for use in high rise structures and buildings.

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 the standards indicated below:

<i>IS No.</i>	<i>Title</i>
325 : 1996	Three-phase induction motors — Specification (<i>fifth revision</i>)
2062 : 2006	Hot rolled low, medium and high tensile structural steel (<i>sixth revision</i>)
2266 : 2002	Steel wire ropes for general engineering purposes — Specification (<i>fourth revision</i>)
2932 : 2003	Enamel, synthetic, exterior: (a) Undercoating, (b) Finishing — Specification (<i>third revision</i>)
3973 : 1984	Code of practice for the selection, installation and maintenance of wire ropes (<i>first revision</i>)
7403 : 1974	Code of practice for selection of standard worm and helical gear boxes
10001 : 1981	Specification for performance requirements for constant speed compression ignition (diesel) engines for general purposes (up to 20 kW)

3 TERMINOLOGY

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

3.1 Builder's Hoist — It shall mean platform hoists with or without tilting bucket and does not include any other type of hoists.

3.2 Unit — It shall comprise of the following parts:

- a) A winch unit;
- b) A mast or masts; and

- c) A platform or platforms with or without bucket.

3.3 Safe Working Load — The maximum external load excluding the weight of platform with bucket.

4 TYPES

Following are the two types of builder's hoist:

- a) Stationary (single or double platform); and
- b) Mobile (single or double platform).

5 CAPACITY

5.1 The capacity of the builder's hoist shall be expressed in terms of safe working loads and are given below:

0.25 t, 0.5 t, 0.75 t and 1 t at 0.3 to 0.5 m/s trolley speed.

5.2 Actual capacity of the hoists shall be 10 percent greater than the safe working load mentioned in **5.1** under normal conditions.

5.3 The portable hoist shall normally work up to a maximum height of 15 m.

6 MATERIALS

6.1 All materials and components of the hoists; unless otherwise specified, shall be in accordance with relevant Indian Standards.

6.2 All diesel engines shall conform to IS 10001.

6.3 All electric motors shall conform to IS 325. Suitable starters/ON-OFF switches shall be provided.

6.4 All gear boxes, couplings, etc, if used, shall conform to the relevant Indian Standards and the selection of gear boxes shall be in accordance with IS 7403.

6.5 The steel wire rope used shall be hemp cored, galvanized, of 6 × 19 or 6 × 37 construction and shall conform to IS 2266. The factor of safety shall not be less than 4. The selection, installation and maintenance of wire ropes shall be in accordance with IS 3973.

6.6 All cast iron pulleys shall be suitably fitted with gun metal bushes.

6.7 Steel sections and plates shall conform to IS 2062.

6.8 The winch shall be provided with a hand lever operated brake as well as with a foot operated brake.

The brake shoes shall be adjustable and provision shall be made to lock the brakes in position.

6.9 Masts

The masts shall be fabricated from structural steel plates and angle/channel sections conforming to IS 2062. They shall be fabricated in jigs so that each mast is an exact replica of the other. They shall be suitably braced. Ends of each mast shall have provision for socketing and bolting with another mast. Top mast shall have anchor provisions for bolting a head pulley and for anchoring wire ropes. The bottom section of the mast shall be provided with heavy duty helical springs for absorption of shock loads due to free fall of the platform/bucket.

6.10 All weld joints shall be in accordance with relevant Indian Standards.

7 CONSTRUCTION

7.1 Unit

It consists of the following.

7.1.1 Prime Mover

Prime mover may be either a diesel engine or an electric motor or both.

7.1.2 A Winch Unit

In general, winch may be a friction type.

7.1.2.1 Winch unit commonly used is a friction winch. This consists of a rotating shaft fitted with two phenol fibre bushes running on gun metal bearings located on two side frames on either side. The frames also house two bearing blocks in which are fitted two cast iron cams through which runs a shaft bearing, a roped run with two cast iron friction flanges. The drum pulley shall be made to mesh with the rotating fibre rollers and reversed back for braking with the help of hand lever.

7.1.2.2 Alternatively, it may consist of a rotating shaft fitted with V-groove cast iron pinion supported on 2 or 3 bushes. The main V-groove pulley is bolted with the drum and rest on cam shaft bushes through a shaft. The drum V-groove pulley shall be made to mesh with the V-groove pulley and reversed back for braking with the help of hand lever.

7.1.3 A fabricated mast of convenient steel sections shall not be more than 3 m in height.

7.1.4 Platform

The hoist may either be a single or a double platform type. Each platform shall have provision for sliding up and down in its respective mast through four steel (hardened) rollers suitably bushed. These rollers are

carried by shafts. The upper shaft passes through two bearing blocks welded on to the platform. All bearing bushes are made of gunmetal (made from proportion of 85 : 5 : 5 : 5), that is, 85 percent copper, 5 percent lead, 5 percent zinc and 5 percent tin. The lower shaft carries a cast iron pulley on a pulley frame clamped on to the shaft through which the wire rope winds.

7.1.5 Emergency Brakes

Emergency braking of platform shall be provided to cater wire rope failure.

7.1.6 Transmission of power from drive unit to winch, shall be through V-belts and pulleys. Hoisting shall be through a wire rope from the winch with minimum safety factor of 4.

7.1.7 The length, width and height of any section of the plant shall be such that it is transported easily.

7.1.8 Based on mutual agreement between the purchaser and the manufacturer, the builder's hoist may be equipped with a crane hook arrangement, fixed at the top of the mast for hoisting/lifting of materials.

7.1.9 All parts and components of the builder's hoists shall be provided with two coats of anti-corrosive primer and one coat of synthetic enamel paint or PVC paint (each of 30 μ thickness) at the shop floor of the manufacturer. The components shall be thoroughly cleaned for removal of rust, oil, grease, dust etc, before application of primer coats. Second coat of synthetic enamel paint or PVC paint (30 μ thick) shall be applied on the hoist after its final assembly/erection at site. Synthetic enamel paints shall conform to IS 2932.

8 SAFETY REQUIREMENTS

Safety guards shall be provided for moving parts in accordance with the relevant safety regulations.

9 PROOF TESTING

9.1 The hoist shall normally be of 0.25 t/0.3 t or 0.5t / 0.6 t or 0.75 t/0.90 t or 1 t/1.25 t. The first number denotes the safe working load to be carried and the second number denotes the weight to which the hoists are to be tested.

9.2 To test the emergency brake, load the platform to the required testing load after jacking up the platform on knock-off pins. Allow the wire rope to go slack and let the serrated cam blocks jam on to the mast. Now knock-off the pins and see, if platform slips. The platform should not slip more than 1 m down with the load.

10 ERECTION

10.1 The manufacturer shall provide drawings for foundation bolts and scaffolding with suitable anchorages, if so desired by the purchaser.

10.2 The manufacturer shall supply an operation and maintenance/instruction manual and spare parts catalogue with each hoist.

10.3 The manufacturer shall supply a list of essential spare parts for two years normal operation.

11 MARKING

The hoist shall be marked with the following:

a) Manufacturer's name;

- b) Machine SI No.;
- c) Engine/Motor capacity;
- d) Capacity of the hoist with related trolley speed;
- e) Year of manufacture;
- f) Rope diameter;
- g) Engine/Motor SI No.; and
- h) Weight of platform, bucket and structures.

ANNEX A (Foreword)

COMMITTEE COMPOSITION

Construction Plant and Machinery Sectional Committee, MED 18

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