

**BUREAU OF INDIAN STANDARDS**

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*भारतीय मानक मसौदा*

**बल्क प्रहस्तन उपस्कर — बैग स्टेकर—सह लोडर सुवाह्य —  
डिजाइन और निर्माण — सामान्य अपेक्षाएँ**

*(आई एस 14704 का प्रथम पुनरीक्षण)*

*Draft Indian Standard*

**BULK HANDLING EQUIPMENT BAG STACKER — CUM — LOADER  
PORTABLE — DESIGN AND CONSTRUCTION — GENERAL  
REQUIREMENTS**

*(First Revision of IS 14704)*

ICS 53.040.10

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**Earth Moving Equipment and Material Handling  
Sectional Committee, MED 07**

**Last date for comments is  
18 Nov 2022**

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**FOREWORD**

*(Formal clause to be added later)*

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Earth Moving Equipment and Material Handling Sectional Committee (MED 07) had been approved by the Mechanical Engineering Division Council.

This Standard was first published in 1999. The first revision of this standard incorporates modifications found necessary as a result of the experience gained with the use of the standard and to bring the standard in line with the present good practices being followed in the country and abroad. The principal modifications in this revision are as follows:

- a) A reference clause has been added mentioning the latest version of the referred standards; and
- b) Editorial corrections have been done.

This standard covers the general requirements of mechanical type portable bag stacker-cum-loader/unloader (PBSCLU). The requirements laid down in the Indian Standard are not withstanding the requirements of any other Statutes, Regulations, Acts and Rules of any Central or State Government Orders issued from time to time which are otherwise to be met.

The PBSCLU are used without much difficulty for stacking in empty godowns and de-stacking fully loaded godowns starting from one end. PBSCLU are also easily used where large aisle ways are provided for straight line loading and unloading. PBSCLU will be transported by trucks for installation in the aisle ways for loading/unloading wagon/trucks.

The PBSCLU can also load and unload the wagon by keeping them in between two tracks. The PBSCLU can load and unload individual wagons, trucks and stacks in the godowns. The PBSCLU will be kept in between the road-fed godowns where there is enough space available for easy manoeuver ability. In addition, it can also be operated by a standby diesel power in case of electric power-cut so that wharfage and demurrages on account of idle labour is eliminated.

The equipment in various configuration is generally used for handling bags during:

- a) Truck loading/unloading;
- b) Wagon loading/unloading (both open and close); and
- c) Stacking/destacking in godowns.

The various configurations of equipments are:

- a) Portable flat belt conveyor with provision of luffing and self-propelled travel; and
- b) Combination of flat belt conveyors with provision of luffing, slewing and self-propelled along with/without telescopic mechanism for conveyor(s).

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 the same as that of the specified value in this standard.

**BULK HANDLING EQUIPMENT BAG STACKER — CUM — LOADER PORTABLE —  
DESIGN AND CONSTRUCTION — GENERAL REQUIREMENTS**

*(First Revision of IS 14704)*

**1 SCOPE**

This standard covers general requirements for design, manufacture and testing of portable bag stacker—cum—loader/unloader (PBSCLU) suitable for stacking/destacking bags of nominal mass of 100 kg and below with provision of luffing and propelling.

**2 REFERENCES**

The standards listed 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 listed below. In case the standards are to be referred in this clause, they are to be listed as follows:

<i>IS No.</i>	<i>Title</i>
8597 : 1977	Specification for flat belt conveyors

**3 GENERAL REQUIREMENTS**

**3.1** Design, manufacture and supply of PBSCLU shall meet the performance requirement as specified by the purchaser.

**3.2** The equipment shall be suitable for the duty conditions as specified by the purchaser.

**3.3** Purchaser shall provide the information as specified in Annex A to the manufacturer for proper design/selection of equipment.

**4 DESIGN AND CONSTRUCTION**

**4.1** Equipment shall be designed to meet the specified requirements in respect of:

- a) Stacking height of bags;
- b) Stacking material;
- c) Type, size and weight of bags to be handled;
- d) Loading/unloading rate of bags; and
- e) Manoeuvrability of equipment to suit the layout and other requirements of the purchaser.

**4.2** The design of the equipment shall be such as to allow the height of bag stacker to be adjusted manually or by power driven system as specified by the purchaser to keep the delivery height at a desired level. The maximum allowable slope of the stacker shall be designed such that no sliding back of bags takes place.

**4.3** Equipment shall be mounted on caster wheels or pneumatic or tubeless type or rail mounted with cable reeling device to allow easy movement of equipment to desired location in the operating area/aisle—ways. The front wheel shall be bigger in diameter than the rear one's to have better manoeuvrability. The rear wheel shall be of swiveling type. Suitable locking arrangement for holding the equipment in position during operation shall be provided.

**4.4** Arrangement shall also be provided to turn the bags to a desired angle by means of guide plate/transfer drum to be located at delivery point in case of multiple conveyor discharge. This shall be an optional feature.

**4.5** Equipment for conveying bags up to 50 kg shall have minimum 650 mm belt width and above 50 kg bags the minimum belt width will be 800 mm.

**4.6** The drive unit shall comprise of reduction gear unit with TEFC squirrel cage induction motor of suitable power rating to match the rated capacity of the equipment. Reversible starter switch with control panel to facilitate forward and reverse operation shall be provided.

**4.7** The constructional features flat belt conveyor shall conform to IS 8597.

## **5 MAIN FEATURES**

**5.1** Equipment shall be single or double boom (retractable) type to meet the purchaser's requirement.

**5.2** The requirement shall be reversible for de-stacking with provision of sack pads to provide extra clearance of 300 mm (*Max*) while destacking.

**5.3** Equipment shall be able to adjust delivery height manually or by power driven system. This shall be self-sustaining. For manual operation it shall not require a force of more than 150 N to operate.

**5.4** Propelling of equipment shall be manual or by power driven system.

**5.5** In case of double boom, retracting of the boom shall be either manual or power driven as specified.

**5.6** Bag counter attachment (optional) shall be provided if so specified by the purchaser.

## **6 DIMENSION**

Equipment shall conform to dimensions given in Table 1.

## **7 OPERATION**

Equipment shall be designed to be operated from push button mounted at the tail end.

## **8 OPTIONAL ITEM**

Automatic display totalizer shall be provided if required by the purchaser.

## **9 TESTING**

**9.1** The schedule of inspection and testing shall be as agreed between the purchaser and the supplier.

**9.2** The equipment shall operate satisfactorily without undue noise, vibrations or display of any unfavourable characteristics.

**9.3** The load testing shall be with reference to current load as well as rated capacity.

## **10 PROTECTION AND PAINTING**

**10.1** The equipment and its sub-assemblies shall be suitably painted. The machine parts shall be protected against rust with a rust-preventive coating.

**10.2** The equipment and its sub-assemblies shall be given two coats of anti-corrosive primer and two coats of anti-corrosive finish paint as specified by purchaser. Each coat shall have 30 micron dry film thickness.

**10.3** The equipment shall be properly packed so as to avoid any damage during transportation.

**10.4** In case, the sub-assemblies or the components have to be packed separately, they shall have suitable marking to match them with the related subassemblies or the components.

**10.5** The equipment shall have identification plate showing:

- a) Manufacturer's name;
- b) Serial number and date of manufacture;
- c) Capacity;
- d) Purchaser's equipment number, purchase order number; and
- e) Any other relevant data.

## **11 SAFETY MEASURES**

**11.1** Proper arrangements shall be made to avoid slipping/failing down of the bags from the equipment.

**11.2** The electric motor, starter, limit switches and cable, etc, shall conform to relevant standards.

**11.3** The lubricating points and bearing shall be dust proof for longer life.

**11.4** The whole structure shall be made with light weight material for easy manoeuvrability.

**11.5** Chain guard or belt guard shall be provided wherever necessary to prevent accidents. Zero speed switch shall be provided to function in case of bag getting struck.

## **12 OPERATIONAL MANUAL**

**12.1** Equipment shall be supplied with a set of drawings, operational and maintenance manual, catalogue and preventive maintenance chart as specified by the purchaser.

**12.2** Manufacturer shall indicate the minimum tools to be kept for maintenance. One set of such tools shall be supplied with each machine by the manufacturer/supplier.

**12.3** Lubrication schedule indicating frequency of lubrication and recommended oil/grease etc. shall be furnished by the manufacturers for preventive maintenance.

**ANNEX A**

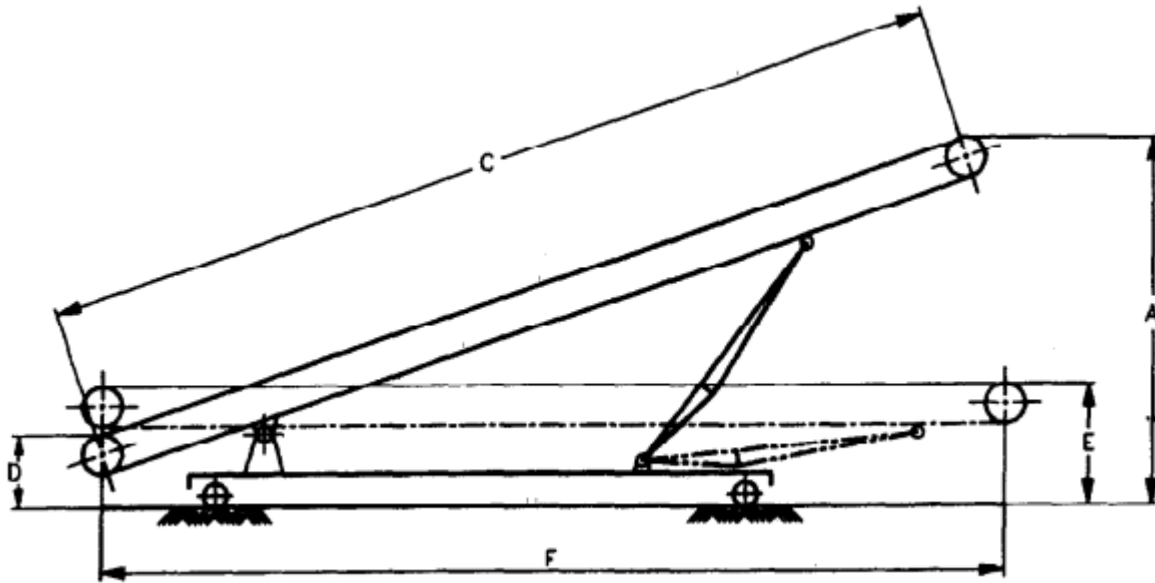
*(Clause 3.3)*

**INFORMATION REQUIRED TO BE SUPPLIED BY PURCHASER**

- a) Stacking material to be handled;
- b) Type, size and weight of bags to be handled;
- c) Mode of transport/truck/wagon;
- d) Type of truck/wagon open/closed;
- e) Stacking height of bags;
- f) Layout plan warehouse/stockyard/godown;
- g) Loading/unloading rate of bags;
- h) Type of equipment — Single/double;
- j) Length of the conveying system — m;
- k) Arrangement for shifting equipment — Pneumatic tyre/tubeless tyre;
- m) Drive arrangement — manual/power driven;
- n) Arrangement of boom retraction — manual/power;
- p) Bag counter arrangement — Yes/No;
- q) Provision of turning of bags to be provided — Yes/No; and
- r) Any other requirement.

(Clause 6)

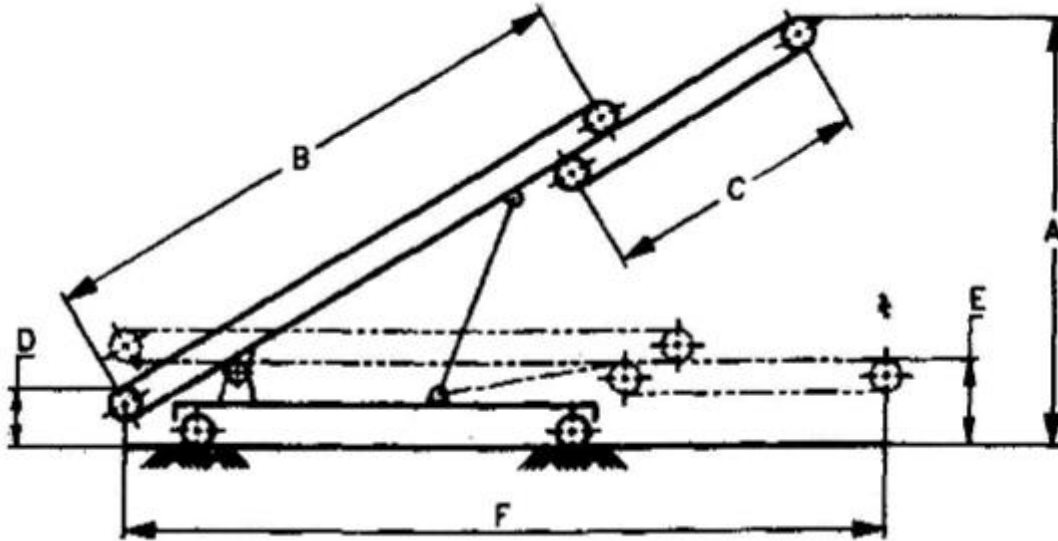
All dimensions in millimetres.



(A)

Sl. No.	Single Boom									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	<b>Model</b>	03	04	05	06	07	08	09	10	
ii)	<b>A</b>	1 800	2 400	3 000	3 600	4 200	4 800	5 400	6 000	
iii)	<b>C</b>	3 000	4 000	5 000	6 000	7 000	8 000	9 000	10 000	
iv)	<b>D</b>	475	475	475	475	525	525	525	525	
v)	<b>E</b>	1 800	1 800	1 800	1 800	1 900	1 900	2 000	2 000	
vi)	<b>F</b>	2 875	3 875	4 850	5 850	6 850	7 800	8 800	9 800	





(B)

Sl. No. (1)	Double Boom				
	(2)	(3)	(4)	(5)	(6)
i)	<b>Model</b>	055	070	085	100
ii)	<b>A</b>	3 000	3 900	4 800	5 700
iii)	<b>B</b>	3 850	4 900	5 950	7 000
iv)	<b>C</b>	1 650	2 100	2 550	3 000
v)	<b>D</b>	525	525	525	525
vi)	<b>E</b>	1 900	1 900	2 000	2 000
vii)	<b>F</b>	5 300	6 800	8 300	9 800