

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

Draft For Comments Only

Doc: TXD 01 (24587) WC

Jan 2024

(Not to be reproduced without permission of BIS or used as Standard)

भारतीय मानक मसौदा

वस्त्रादि — पटसन और पटसन आधारित बोरे — पात परीक्षण पद्धति
(आई एस 13035 का पहला पुनरीक्षण)

Draft Indian Standard

TEXTILES — JUTE AND JUTE BASED BAGS — METHOD FOR DROP TEST

(First Revision of IS 13035)

ICS 55.080

Physical Methods of Test Sectional
Committee, TXD 01

Last date for receipt of comments is
10 March 2024

FOREWORD

(Formal clauses will be added later)

This standard was first published in 1991. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

- a) Requirements for conditioning of bags have been incorporated;
- b) A reference clause has been added;
- c) Principle of drop test has been incorporated; and
- d) Mention other modifications, if any.

Drop test has been recognized as a method of test for determining the behaviour of bags filled with various materials as it gives a fair idea as to how filled bags are likely to withstand handling during transportation and subsequently.

Number of drop testing equipment are available for carrying out drop test under controlled and

reproducible conditions. The test involves suitable arrangement for lifting the filled bags to a desired height by use of mechanical/electrical effort and subsequently dropping these bags on the floor in different bag positions/angles.

In the preparation of this standard, considerable assistance has been derived from the following standards:

ISO/FDIS 7965-1	Packaging Drop test Part 1: Paper sacks
ISO 7965-2 : 1993	Sacks Drop test Part 2: Sacks made from thermoplastic flexible film

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

1 SCOPE

This standard prescribes constant drop height and progressive drop height methods for conducting drop test on filled jute and jute based bags under controlled and reproducible conditions.

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 these standards:

<i>IS No.</i>	<i>Title</i>
IS 6359 : 2023	Method for conditioning of textiles (<i>first revision</i>)

3 PRINCIPLE

The filled bag is raised above a rigid surface and released to strike this surface after a free fall. The atmospheric conditions, the height of the drop and the position of the package shall be set in advance.

4 ATMOSPHERIC CONDITIONS FOR TESTING

The test shall be carried out in the prevailing atmospheric conditions of relative humidity between 40 percent and 90 percent.

5 APPARATUS

5.1 The apparatus necessary to carry out the drop test shall include the following:

- a) A lifting arrangement which will not damage the bag during either lifting or release.

- b) Means for holding the bag prior to release in its predetermined position.
- c) A mechanism to release the bag in such a way that its fall is not obstructed by any part of the apparatus before striking the impact surface.
- d) A mechanism for height adjustment from 900 mm to 3 600 mm at the required intervals.
- e) The impact surface shall be horizontal and flat, massive enough to be immovable and rigid enough to be non-deformable under test conditions.

6 CONDITIONING

The filled and closed bags shall be conditioned at standard atmosphere at (65 ± 2) percent relative humidity and $27\text{ °C} \pm 2\text{ °C}$ temperature for 24 h in such a way as to expose, as far as possible, all portions of the specimens to the atmosphere (*see* IS 6359).

7 PROCEDURE

7.1 Fill the bag with the required material to a specified mass keeping free space of approximately 3 percent of the full capacity of the bag (with respect to free space, if any details have been laid down in the relevant Indian Standard, the same shall be followed). Stitch the opening as prescribed in the relevant Indian Standard on bags.

NOTE — The following Indian Standards cover various types of jute bags:

IS 1943 : 1995 Textiles — A-twill jute bags (*second revision*)
 IS 2566 : 1993 Textiles — B-twill jute bags for packing foodgrains — Specification (*third revision*)
 IS 2874 : 1993 Textiles — Heavy cee jute bags — Specification (*first revision*)
 IS 3790 : 1971 Textiles — Hessian bags — Specification (*second revision*)
 IS 3984 : 2002 Textiles — DW flour bags — Specification (*first revision*)
 IS 9685 : 2002 Textiles — Sand bags — Specification (*first revision*)
 IS 12650 : 2018 Textiles — Jute bags for packing 50 kg foodgrains — Specification (*third revision*)
 IS 15138 : 2010 Textiles — Jute bags for packing 50 kg sugar — Specification (*first revision*)
 IS 16186 : 2014 Textiles — Light weight jute sacking bags for packing 50 kg foodgrains — Specification

7.2 Place the filled bag under test at the centre of the platform of the testing machine (*see* Fig. 1) or grip the filled bag centrally in the gripping arrangement of the butt drop testing machine (*see* Fig. 2). Raise it to the predetermined height and release to drop on the impact surface according to the dropping procedure indicated in **7.2.1** and **7.2.2**. The designation of various surfaces of the filled bag is shown in Fig. 3.

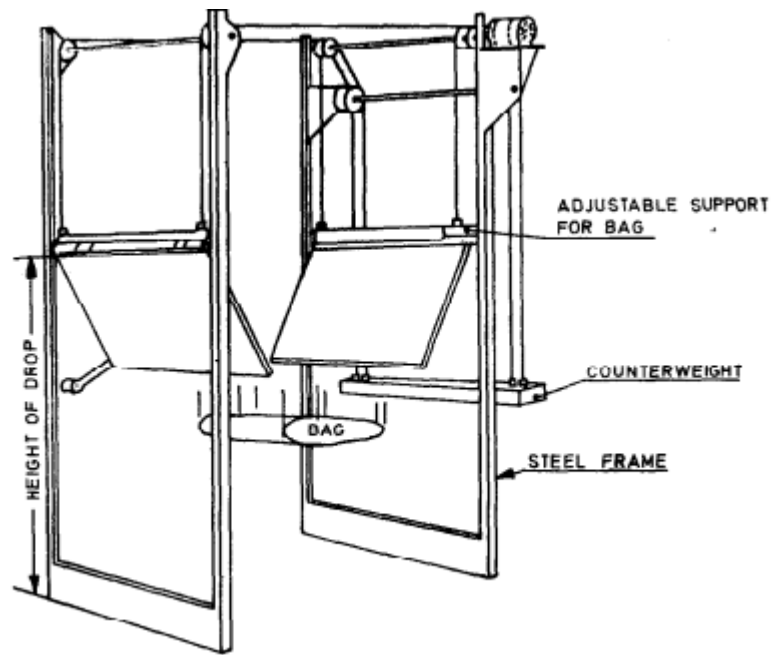


FIG. 1 EXAMPLE OF ARRANGEMENT SUITABLE FOR
FLAT AND SIDE DROPPING

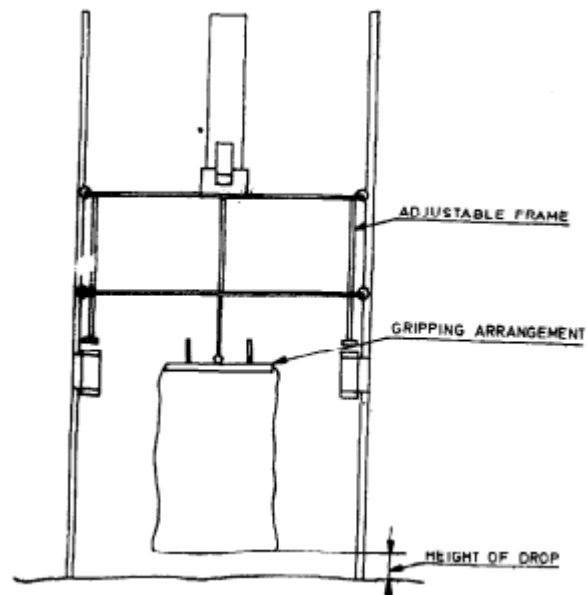


FIG. 2 EXAMPLE OF ARRANGEMENT SUITABLE
FOR BUTT DROPPING

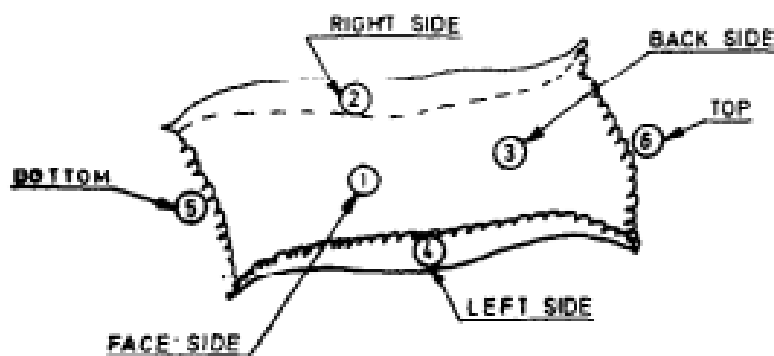


FIG. 3 SURFACE IDENTIFICATION OF
PACKED BAG

7.2.1 *Constant Drop Height Method*

This method may be used for flat, side, butt and corner drop testing of jute and jute based bags.

7.2.1.1 *Flat drop*

Subject the filled bag to successive drops alternately on each on two flat faces [see surfaces (1) and (3) in Fig. 3] from a height of 1 800 mm and if the bag withstands five such drops, make the final dropping from a height of 3 600 mm on any face.

7.2.1.2 *Side drop*

Subject the filled bag to similar drops as in 7.2.1.1 alternately on each of the two sides [see surfaces (2) and (4) in Fig. 3] from a height of 1 800 mm and if the bag withstands five such drops, make the final dropping from a height of 3 600 mm on any side.

7.2.1.3 *Butt drop*

Subject the filled bag to drop on bottom end [see surfaces (5) in Fig. 3] first from a height of 900 mm. If the bag withstands this drop, make the next drop from a height of 1 200 mm in same position of the bag.

7.2.1.4 *Corner drop*

If this test is necessary, drop the filled bag on any of its corners from heights as prescribed in 7.2.1.3.

7.2.2 *Progressive Drop Height Method*

This method may also be used for testing jute and jute-based bags for flat, side and butt drops.

7.2.2.1 *Flat drop*

Drop the filled bag on any of the flat faces [see surfaces (1) and (3) in Fig. 3] initially from a height of 1 800 mm. If there is no visible failure on the bag after each test, increments of 300 mm

in drop height are made till a maximum height of 3 600 mm is attained. Successive drops should be made alternately on the two flat faces [see surfaces (1) and (3) in Fig. 3].

7.2.2.2 Side drop

Drop the filled bag on any side [see surfaces (2) and (4) in Fig. 3] initially from a height of 1 800 mm. If there is no failure visible on the bag after each drop, increment of 300 mm in drop height are made till a maximum height of 3 600 mm is attained. Successive drops should be made alternately on each side [see surfaces (2) and (4) in Fig. 3].

7.2.2.3 Butt drop

Drop the filled bag on bottom and [see surface (5) in Fig. 3] initially from a height of 900 mm. If there is no failure visible on the bag after each drop increment of 150 mm drop height are made till a maximum height of 1 800 mm is attained. Successive drops are made alternately on bottom end and top end [see surface (5) and (6) in Fig. 3].

NOTES

1 The initial height of 1 800 mm for flat and side drop testing corresponds to the height of a tall man and the final height 3 600 mm corresponds to the height of a stack in small-sized storage go down.

2 The initial height for butt drop is set at 900 mm and maximum height set at 1 800 mm because the whole reaction is distributed over a small area compared to flat and side positions of dropping and the effective pressure is higher in the former case. The chances of falling a bag on its butt are more when it is being lifted by hands for weightment or transportation. (Usually in neither of these, height gained is more than the given height, that is, 900 to 1 800 mm.)

3 The increment in height has been chosen as 300 mm for flat and side drop and 150 mm for butt drop on the basis of one-sixth of the initial height in each case.

8 REPORTING OF RESULTS

8.1 A bag shall be reported as damaged if there is any rupture of the fabric or opening of the seam resulting in the contents being spilled out.

8.2 The number of bags tested specified in the sampling procedure in the corresponding product specification, shall be reported.

8.3 The test results shall be reported as the number of drops and the height required to damage the bags or the effect of drops from constant height on the bags.

8.4 The test results shall be reported in the format given in Annex A and shall contain the following information:

- a) Type of bag tested;
- b) Dimensions and mass of bag;
- c) Construction of bag;
- d) Type of contents and mass of contents;
- e) Type of dropping and method (progressive or constant drop height) used;
- f) Number of bags tested;

- g) Number of drops and final height required for failure or without causing any failure of individual bag;
- h) Cause of failure (twine/cloth edge); and
- i) Extent of damage.

Annex A
(Clause 8.4)

DROP TEST REPORT

Test Particulars:

Manufacturer

Customer

Bag specification

Dimensions

Filling material

Gross mass

Nett mass

Test method (constant or progressive drop height)

Type of drop

Conditioning

Test Results:

	Drop No.	Drop Height	Bag No.									
			1	2	3	4	5	6	7	8	9	10
1												
2												
3												
4												
5												
6												
7												
Number of drops for failure												
Type of damage (twine/cloth/edge)												
Extent of damage												
Remark												