भारतीय मानक

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(दूसरा पुनरीक्षण)

Indian Standard

TEXTILES — WOVEN SACKS FOR PACKING CEMENT — HIGH DENSITY POLYETHYLENE (HDPE)/POLYPROPYLENE (PP) — SPECIFICATION

(Second Revision)

ICS 621.796.151:[678.742]

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 3

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by Textile Materials Made from Polyolefins (Excluding Cordage) Sectional Committee had been approved by the Textile Division Council.

This standard was first published in 1986 and subsequently revised in 1992 to amalgamate IS 11653 'Polypropylene (PP) woven sacks for packing cement' as the requirements for both were similar. In addition, the requirements for non-gusseted sacks had been incorporated.

This revision of the standard has been taken up to incorporate the changes suggested by National Council for Cement and Building Materials (NCCBM) after extensive laboratory testing of samples of HDPE/PP woven sacks for packing cement and also the views of various users. Mainly the following requirements have been modified:

a) Requirements of, ends, picks, mass of fabric, and breaking load of fabric as well as top and bottom seam.

b) Requirements for elongation at break of the fabric and mass of sack has been incorporated.

c) The method for sampling and criteria for conformity has been simplified.

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 '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 the standard.

Indian Standard

TEXTILES — WOVEN SACKS FOR PACKING CEMENT — HIGH DENSITY POLYETHYLENE (HDPE)/POLYPROPYLENE (PP) — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements of high density polyethylene (HDPE)/Polypropylene (PP) woven sacks for packing cement.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publications, the edition 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:

IS/ISO No.	*Title*
1964 : 1970	Methods for determination of weight per square metre and weight per linear metre of fabrics (*first revision*)
1969 : 1985	Methods for determination of breaking load and elongation of woven textile fabrics (*second revision*)
6192 : 1994	Textiles — Monoaxially oriented high density polyethylene tapes — Specification (*second revision*)
6359 : 1971	Method for conditioning of textiles
9030 : 1979	Method for determination of seam strength of jute fabrics including their laminates
10789 : 1983/ ISO 4915 : 1981	Classification and terminology of stitch types used in seams
11197 : 1985	Specification for monoaxially oriented polypropylene tapes

3 TERMINOLOGY

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

3.1 Gusset — A fold inserted in the longitudinal edge of a tube or sack.

3.2 Gusseted Sack — A sack manufactured from a gusseted tube.

3.3 Flat Sack — A sack manufactured from a flat tube.

4 MANUFACTURE

4.1 Fabric

The fabric used in the manufacture of HDPE/PP woven sacks for packing cement shall be woven from high density polyethylene tapes/polypropylene tapes. The width of tapes used for making fabric shall be 2.5 mm, *Min* (*see* IS 6192 or IS 11197).

4.2 Sack

The sack shall be produced from fabric woven as a tube and cut to the required length.

4.2.1 *Tubular Woven*

The sack tube is woven on circular loom. Alternatively, the sack tube may be woven on a flat bed loom which effectively weaves two layers of fabrics. The weft is passed *via* the shuttle through each layer in such a way that it forms a tube in which the weft is continuous around the tube so formed.

4.3 Seam

The stitching shall be done only at the bottom and at the mouth of the sack excluding valve. The stitching shall be done with either one row or two rows of chain stitches (*see* IS 10789/ISO 4915). In case of two rows of stitches, the same shall be separated from each other by minimum 5 mm and the outer row of the stitching/ single row stitching shall be minimum 8 mm from the outer edge of the sack. The stitching shall be done with a fold over seam to a depth of minimum 25 mm so that the stitches pass through minimum four layers of the fabric. The number of stitches per dm shall be 14 ± 2 . The stitching shall be done by rayon, nylon or any other suitable thread having breaking load not less than 75 N.

4.3.1 The stitching shall be uniform and without any loose thread or knot.

4.4 Valve for Filling of Sacks

The valve shall be formed at one corner of the top of the sack by folding the corner of the sack inside first. There shall be a double fold at the top seam and then stitching shall be done through six layers.

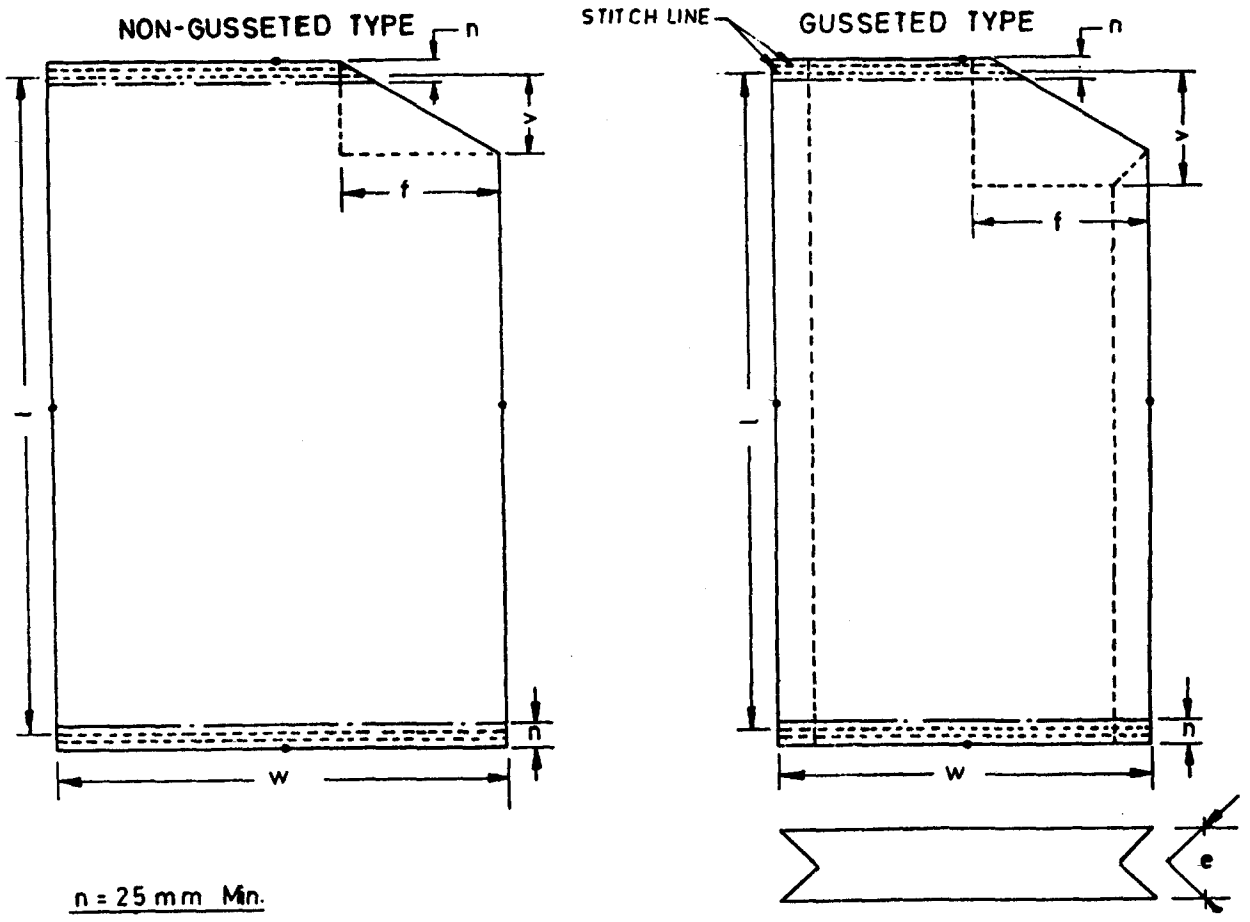

FIG. 1 VALVED STITCHED SACK

The depth of the valve (*f*) shall not be less than two times the width of valve (*v*) in case of gusseted sacks and not less than 2.3 times the width of valve (*v*) in case of non-gusseted sacks.

4.5 The sack shall have a nominal capacity of holding 50 kg cement.

5 ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING

5.1 Prior to test, the specimens shall be conditioned to moisture equilibrium from dry side in the standard atmosphere of 65± 2 percent relative humidity and 27 ± 2°C temperature as laid down in IS 6359.

5.2 The test shall be carried out in the standard atmosphere (*see* **5.1.1**).

6 REQUIREMENTS

The HDPE/PP woven sacks, gusseted and non-gusseted, for packing cement shall conform to the requirements specified in Table 1.

7 MARKING AND PACKING

7.1 Marking on Sacks

The sack shall be printed with identification mark of sack manufacturer along with the information as required by the buyer using suitable inks by flexography.

7.2 Packing

The sacks shall be packed to form a bale using a layer of HDPE/PP woven fabric and suitably secured. The bale shall contain 500 sacks and multiples thereof.

7.3 The bales shall be marked with the following information:

a) Name of the manufacturer;
b) Type and size of sacks;
c) Number of sacks;
d) Gross weight;
e) Net weight;
f) Month and year of manufacture; and
g) Any other information required by the buyer.

Table 1 Requirements of HDPE/PP Woven Sacks for Packing Cement

(*Clause* 6)

Sl No.	Characteristic	Requirement	Tolerance	Method of Test
i)	Dimensions, cm (*see* Note 1)			
	a) Length of sack, inside (*l*)	71	± 1.0 cm	Annex A
	b) Width of the sack (*w*)	48		
	c) Width of gusset (*e*)	7.6		
	d) Width of valve (*v*)	9	+ 1.0 cm/ – 0.5 cm	
	e) Depth of valve, *Min* (*f*)	As per clause 4.4	—	
ii)	Ends per dm	40	± 1	Annex A
iii)	Picks per dm	40		
iv)	Mass of sack, *g* (*see* Note 2)			Annex B
	a) Non-gusseted type	70	± 6 Percent	
	b) Gusseted type	71		
v)	Average breaking strength of fabric, N (kgf [1]), *Min* (Ravelled strip method, 325 mm × 70mm [2])			IS 1969
	a) Widthwise	850 (87)		
	b) Lengthwise	850 (87)		
vi)	Elongation at break of fabric (Ravelled strip method), percent			IS 1969
	a) Widthwise	20	± 5	
	b) Lengthwise	20		
vii)	Average breaking strength of top and bottom seam (Strip method) N(kgf [1]), *Min*	390 (40)	—	IS 9030

NOTES

1 The buyer and the seller may agree to dimensions other than those specified above. However, tolerances as specified in Table 1 shall apply. The mass of sacks with dimensions other than those specified shall be calculated by the method given in Annex B. The mass of sack with two folds bottom seam instead of one fold shall also be calculated.

2 The tolerance on net mass (excluding packing material) of the bale of 500 sacks shall be ± 3 percent.

[1] 1N = 0.102 kgf (approx).

[2] Width after ravelling = 50 mm, gauge length = 200 mm.

7.4 BIS Certification Marking

Each bale containing HDPE/PP sacks may also be marked with the Standard Mark.

7.4.1 The use of Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and rules and regulations made thereunder. The details of the conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 SAMPLING AND CRITERIA FOR CONFORMITY

8.1 Lot

In any consignment, all the sacks of the same construction shall be grouped together to constitute a lot.

8.2 The conformity of the lot to the requirements of the standard shall be determined on the basis of the test carried out on the samples selected from it.

8.3 The number of bales to be selected depends on the size of the lot and shall be in accordance with col 1 and 2 of Table 2. The number of sacks to be selected from the bales sampled shall be in accordance with col 3 and 4 of Table 2.

Table 2 Sample Size and Criteria for Conformity

Number of Sacks in Lot	Number of Bales to be Sampled	Sample Size for Visual, Mass of Sack Inspection, Dimensions, Ends, Picks and Requirements	Sample Size for Breaking Strength and Elongation at Break of Fabric and Breaking Strength of Seam Requirements
(1)	(2)	(3)	(4)
Up to 12 500	3	13	8
12 501 to 25 000	5	20	8
25 001 to 50 000	8	32	13
50 001 and above	12	50	20

8.4 Criteria for Conformity

The lot shall be considered as conforming to the requirements of this standard if the following conditions are satisfied:

a) The number of defective sacks in case of visual inspection, ends, picks and dimensions is up to 10 percent of the sample size, subject to rounding off the fraction number to next higher integer.

b) Mass of none of sacks tested shall be less than 6 percent of specified mass. However, mass of 500 sacks constituting a bale or multiples thereof shall not be less than –3 percent of specified mass of the bale.

c) Average breaking strength of fabric in both lengthwise and widthwise directions is not left less than the value specified and none of the individual value is more than 10 percent below.

d) Ten percent of the samples subject to rounding off the fraction to next higher integer can have individual top and bottom seam breaking strength up to 330 N (34 kgf), provided that average specified seam strength at top and bottom of all the samples under test is 390 N (40 kgf).

e) No sack shall have percentage elongation at break outside the specified range.

ANNEX A

(*Table* 1)

METHODS OF TEST

A-1 METHOD OF TEST FOR LENGTH AND WIDTH

A-1.1 Lay each sack as selected in Table 2 , flat on a table. Render it free from creases and wrinkles and measure the inside length (l) and width (w) about the middle to the nearest 0.5 cm.

A-2 METHOD OF TEST FOR ENDS AND PICKS PER DECIMETRE

A-2.1 Count the ends and picks at two places of each sack as selected in Table 2, with a suitable gauge measuring 5 cm. Care should be taken to avoid counting same set of warp or weft threads more than once. Determine the average ends/dm and picks/dm of each sack under test.

ANNEX B

(*Table* 1)

METHOD FOR CALCULATION OF MASS OF SACKS

B-1 CALCULATION OF MASS OF SACKS

B-1.1 Total mass of sack comprises of:

a) mass of fabric, and

b) mass of stitching tape or thread.

B-1.1.1 Calculation of mass of the sack with the help of the following formulae as the case may be:

i) Mass of fabric:

a) For plain (non-gussetted) sack:

$$g = \left[1 + (v \times 1.3) + 55 \text{ mm}\right] \times 2w \times m \times 10^{-6}$$

b) For gussetted sack:

$$g = \left[1 + v + \frac{1}{2e} + 55 \text{ mm}\right] \times 2w \times m \times 10^{-6}$$

ii) Mass of stitching tape or thread:

$$g_1 = l_1 \times t \times 10^{-6}$$

where

g = mass of sack in g,

l = length of sack in mm (measured for stitch to stitch),

w = width of sack in mm,

v = width of valve in mm,

m = mass of fabric in grams per square metre that is, 82 g/m^2,

e = width of gusset in mm,

g_1 = mass of stitching tape/thread in g,

l_1 = length of stitching tape in mm, and

t = linear density of stitching tape in mm.

Bureau of Indian Standards

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