IS 14887 (2000): Textiles - High Density Polyethylene (HDPE)/Polypropylene (PP) Woven Sacks for Packing 50 kg/25 kg Foodgrains [TXD 23: Textile Materials made from Polyolefins]

BLANK PAGE

REAFFIRMED 2006

IS 14887 : 2000

भारतीय मानक

वस्त्रादि — 50 किग्रा/25किग्रा खाद्यान पैक करने के लिए उच्च घनत्व पोलीइथाइलीन (एच.डी.पी.ई.)/पोलीप्रोपाइलीन (पी.पी.) के बोरे — विशिष्टि

Indian Standard

TEXTILES — HIGH DENSITY POLYETHYLENE (HDPE)/ POLYPROPYLENE (PP) WOVEN SACKS FOR PACKING 50 kg/25 kg FOODGRAINS — SPECIFICATION

ICS 55.080;67.060;83.080.20

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 2000

Price Group 3

Textile Materials Made from Polyolefins (Excluding Cordage) Sectional Committee, TX 23

FOREWORD

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

This standard has been prepared keeping in view of the permission granted by Government of India for limited use of non-jute bags for packing foodgrains. High density polyethylene (HDPE)/ polypropylene (PP) woven sacks are already being used for packing of fertilizer and cement etc. Accordingly this standard has been formulated taking into consideration the experience of use of such sacks. The standard covers sacks with capacity to pack 25 or 50 kg foodgrains.

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 rounding 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.

AMENDMENT NO. 2 FEBRUARY 2009
TO
IS 14887 : 2000 TEXTILES — HIGH DENSITY POLYETHYLENE (HDPE)/POLYPROPYLENE (PP) WOVEN SACKS FOR PACKING 50 kg/25 kg FOODGRAINS — SPECIFICATION

(*Page* 1, *clause* **3.2**) — Add the following at the end of first sentence:

'If required, anti-slip weave patterns on weaving machine (circular looms) of four shuttles or more may be used.'

(TX 23)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 1 AUGUST 2007
TO
IS 14887 : 2000 TEXTILES — HIGH DENSITY POLYETHYLENE (HDPE)/POLYPROPYLENE (PP)WOVEN SACKS FOR PACKING 50 kg/25 kg FOODGRAINS — SPECIFICATION

(*Page* 3, *clause* 7.3) — Substitute the following for the existing clause:

'The number of samples to be selected depends on the size of the lot and number of bales to be sampled shall be in accordance with col 1 and col 2 of Table 2. The number of sacks to be selected from the bales sampled shall be in accordance with col 3 of Table 2 for visual inspections, dimensions, ends, picks and mass requirements, in accordance with col 4 of Table 2 for breaking strength of fabric before exposure to UV radiations, breaking strength of bottom seam and percent elongation at break while it shall be in accordance with col 5 of Table 2 for breaking strength of fabric after exposure to UV radiations requirements.'

(*Page* 3, *Table* 2) — Substitute the following for the existing table:

Table 2 Sample Size and Criteria for Conformity
(*Clauses* 7.3 *and* 7.4)

No. of Sacks in the Lot	No. of Bales to be Sampled	Sample Size for Visual Inspection, Dimensions, Ends, Picks and Mass Requirements	Sample Size for Breaking Strength of Fabrics Before Exposure to UV Radiation, Breaking Strength of Seam and Elongation at Break Requirements	Breaking Strength of Fabric after Exposure to UV Radiation Requirement
(1)	(2)	(3)	(4)	(5)
Up to 12 500	3	13	8	1
12 501 to 25 000	5	20	8	2
25 001 to 50 000	8	32	13	3
50 001 and above	12	50	20	4

(TX 23)

Reprography Unit, BIS, New Delhi, India

Indian Standard

TEXTILES — HIGH DENSITY POLYETHYLENE (HDPE)/ POLYPROPYLENE (PP) WOVEN SACKS FOR PACKING 50 kg/25 kg FOODGRAINS — SPECIFICATION

1 SCOPE

This standard prescribes the requirements of HDPE/ PP woven sacks suitable for packing foodgrains such as wheat, rice, pulses, millet and similar grains.

2 REFERENCES

2.1 The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provision 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 in Annex A.

3 MANUFACTURE

3.1 Raw Material

The high density polyethylene (HDPE) or polypropylene (PP) used for manufacture of tape shall conform to the requirements specified in IS 10146 or IS 10910 respectively.

3.2 Fabric

The fabric used in the manufacture of HDPE/PP woven sacks shall be woven as a tube on circular loom from HDPE/PP tapes having width of 2.5 mm conforming to IS 6192 or IS 11197. The fabric shall be tightly woven having crushed tapes so that the grains do not ooze out from the sack. The constructional particulars of fabric shall be as given in Table 1.

NOTE – The construction particular specified are expected to ensure airation of foodgrains.

3.3 Sack

3.3.1 *Bottom Seam*

The stitching of bottom seam shall be done with two rows of chain stitch (*see* IS 10789/ISO 4915). The two rows of stitches shall be separated from each other by minimum 4 mm and the outer stitch shall be minimum 7 mm from the outer edge of the sacks. The stitching shall be done with single or double fold over seam to a depth of minimum 25 mm, so that the stitches pass through a minimum of four layers of the fabric. The number of stitches/dm shall be 14 ± 2.

3.3.1.1 The material used for stitching shall be HDPE/ PP tape or any other thread suitable for the purpose. The stitching shall be uniform without any loose thread or knot.

3.3.2 *Mouth*

The completely open mouth of the sack shall be hemmed with a fold of minimum 5 mm and tapes shall not fray. The loose liner, if required, shall be inserted inside the sack and shall be hemmed into the mouth with single hem.

3.3.3 *Liner*

If required by the buyer, the unlaminated sacks shall be provided with a loose liner of food grade virgin LDPE/ LLDPE/HMHDPE conforming to IS 10146. The width of the loose liner shall be 10 percent more than the width of the sack. The thickness of the loose liner, when tested in accordance with A-2 of IS 2508 shall be 70 µm ±10 percent in case of LDPE/LLDPE and shall be 40 µm ±10 percent in case of HMDPE. The bottom seam of the loose liner shall be at least 25 mm from the bottom edge.

3.3.3.1 The liner shall be free from pin holes, patches, tears, blisters and any other visible defects.

4 REQUIREMENTS

4.1 The sacks shall conform to the requirements specified in Table 1.

4.2 UV Resistance

The HDPE/PP woven fabric of sack made out of UV stabilized material shall have at least 50 percent of the original breaking strength when tested after the same has been exposed to UV radiation and weathering as per the method given in Annex D.

4.3 Mass of Bale

The mass of bale of sacks (excluding packing materials) shall be within ± 3 percent of the mass calculated by multiplying the number of sacks with the mass of sack specified in Table 1.

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

(*Clauses* 3.2, 4.1 *and* 4.3)

Sl No.	Characteristic	Requirement		Tolerance	Method of Test, Ref to IS No.
		Type 1	Type 2		
(1)	(2)	(3)	(4)	(5)	(6)
i)	Capacity	50 kg	25 kg		
ii)	Dimensions, cm (*see* Notes 1 and 2)				
	a) Inside length	100	65	+2 cm −1 cm	IS 1954
	b) Inside width	57	48		
iii)	Mass of sack, g (*see* Note 3)	135	67	+6 percent −3 percent	IS 1964
iv)	Ends per dm	48	44	± 2	Annex B
v)	Picks per dm	48	44		Annex B
vi)	Average breaking strength of fabric, *Min* (Revelled strip method, 325 mm × 70 mm[1]), N[2] (kgf)				IS 1969
	a) Lengthwise	882 (90)	784 (80)		
	b) Widthwise	882 (90)	784 (80)		
vii)	Average breaking strength of bottom seam (Strip method), *Min* N[2] (kgf)	363 (37)	323 (33)		IS 9030
viii)	Elongation at break of fabric (Ravelled strip method), percent				IS 1969
	a) Lengthwise	20	20	± 5	
	b) Widthwise	20	20		

NOTES

1 The specified dimensions provide for optimum free space of minimum 20 percent of length when measured along the surface of the fabric from mouth-stitch line of the sacks up to the surface level of contents.

2 The HDPE/PP woven sacks of specified dimension are suitable for packing of foodgrains such as wheat, rice, pulses, millet and other similar grains. For packing of other grains, the buyer and the seller may agree to the dimensions other than those specified above. The tolerances specified would apply on agreed dimensions. The mass of such sacks shall be calculated by the method given in Annex C.

3 The mass of sack is based on fabrics weighing 106 g/m² and 96 g/m² for Type 1 and Type 2 sacks respectively.

[1] Width after ravelling = 50 mm, Gauge length = 200 mm.

[2] 1 N = 0.102 kgf (approx).

5 PRINTING AND PACKAGING

5.1 Printing on Sacks

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

NOTE — The inks, found most suitable, for printing are those based on polyamide resins.

5.2 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 multiple thereof.

5.3 The bales shall be marked with the following information:

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

5.4 BIS Certification Marking

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

5.4.1 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.

6 ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING

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.

7 SAMPLING AND CRITERIA FOR CONFORMITY

7.1 Lot

All the sacks of the same construction in a consignment shall be grouped together to constitute a lot.

7.2 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.

7.3 The number of samples to be selected depends on the size of the lot and the number of bales to be sampled shall be in accordance with col 1 and col 2 of Table 2. The number of sacks to be selected from the bales sampled shall be in accordance with col 3 of Table 2 for visual inspections, dimensions, ends, picks and mass requirements and shall be in accordance with col 4 of Table 2 for breaking strength of fabric before and after exposing to UV radiation, breaking strength of bottom seam and percent elongation at break requirements.

7.4 Criteria for Conformity

The lot shall be considered as conforming to the requirements of the 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 to next higher integer.

b) None of the sacks and bale of 500 sacks weighs less than −3 percent of specified value and calculated mass of bale respectively.

c) The average breaking strength of fabric in both lengthwise and widthwise direction is not less than the value specified and none of the individual value is more than 10 percent below the specified value. The test shall be carried out on centre portion of the sack.

d) Ten percent of the samples subject to rounding off the fraction to next higher integer, can have bottom seam strength up to 323 N (33 kgf) in case of 50 kgs sack and 294 N (30 kgf) in case of 25 kgs sack, provided that average specified seam strength of all the samples under test is 363 N (37 kgf) in case of 50 kgs sack and 323 N (33 kgf) in case of 25 kgs sack.

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

f) None of the samples after exposing to UV radiation and weathering shall have breaking strength less than 50 percent of the original breaking strength.

Table 2 Sample Size and Criteria for Conformity

(*Clauses* 7.3 *and* 7.4)

No. of Sacks in Lot	No. of Bales to be Sampled	Sample Size for Visual Inspection, Dimensions, Ends, Picks and Mass Requirements	Sample Size for Breaking Strength of Fabrics Before and After Exposing to UV Radiation, Breaking Strength of Seam and Elongation at Break Requirement
(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

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS/ISO No.	*Title*	*IS/ISO No.*	*Title*
1954 : 1990	Methods for determination of length and width of fabrics (*second revision*)	9030 : 1979	Method for determination of seam strength of jute fabrics including their laminates
1964 : 1970	Methods for determination of weight per square metre and weight per linear metre of fabrics (*first revision*)	10146 : 1982	Specification of polyethylene for its safe use in contact to food stuffs, pharmaceuticals and drinking water
1969 : 1985	Method for determination of breaking strength and elongation of woven textile fabrics (*second revision*)	10789 : 1983/ ISO 4915 : 1981	Classification and terminology of stitch types used in seams
2508 : 1984	Specification for low density polyethylene films (*second revision*)	10910 : 1984	Polypropylene and its copolymer for its safe use in contact with food stuffs, pharmaceuticals and drinking water
6192 : 1994	Textiles — Monoaxially oriented high density polyethylene tapes — Specification (*second revision*)	11197 : 1985	Monoaxially oriented polypropylene tapes
6359 : 1971	Method for conditioning of textiles		

ANNEX B

(*Table* 1)

METHOD OF TEST FOR ENDS AND PICKS PER DECIMETRE

B-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 C

(*Table* 1)

METHOD FOR CALCULATION OF MASS OF SACKS

C-1 Total mass of sacks comprises of (a) mass of fabric, and (b) mass of stitching tape or threads.

C-1.1 Calculate the mass of sacks with the help of the following formula as the case may be:

a) 1) Mass of tubular fabric (single fold stitching)

$$G = (L + 40 \text{ mm}) \times 2W \times M \times 10^{-6}$$

2) Mass of tubular fabric (double fold stitching)

$$G = (L + 65 \text{ mm}) \times 2\ W \times M \times 10^{-6}$$

b) Mass of stitching tape or thread

$$G = (L_1 + T) \times 10^{-6}$$

where

G = Mass of sack in g,

L = Length of sack in mm,

L_1 = Approximate length of stitching tape or thread in mm,

W = Width of sack in mm,

M = Mass of fabric in g/m^2, and

T = Linear density of stitching tape in tex.

ANNEX D

(*Clause* 4.2)

UV RESISTANCE TEST

D-1 To determine the effect of UV radiation and weathering on the breaking strength, the HDPE/PP woven fabric shall be exposed as given in **D-2** and **D-3**.

D-2 TEST CONDITION

The test shall be carried out with fluorescent UV- lamp Type B.

The duration of the test shall be 144 hours (that is, six days).

The test cycle shall be : 8 hours at + 60°C with UV-radiation alternating with 4 hours at + 50°C with condensation.

D-3 TEST PROCEDURE

Specimens are alternately exposed to ultravoilet light alone and to codensation in a respective cycle.

The UV source is an array of fluorescent lamps, with lamp emission concentrated in the UV range.

Condensation is produced by exposing the test surface to a heated, saturated mixture of air water vapour, while the reverse side of the test specimen is exposed to the cooling influence of ambient room air.

The fluorescent UV-lamp, the timing of the UV and condensation exposure, the temperature of condensation shall be specified above.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. TX 23 (0437).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110 002	323 76 17 323 38 41
Eastern	: 1/14 C. I.T. Scheme VII M, V. I. P. Road, Kankurgachi, CALCUTTA 700 054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160 022	60 38 43 60 20 25
Southern	: C. I. T. Campus, IV Cross Road, CHENNAI 600 113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400 093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM.

Printed at : Prabhat Offset Press, New Delhi-2