Bhoramdeo Sahakari Shakkar Karkhana Maryadit Kawardha, District- Kabirdhaam C.G.

Specification of Polypropleyne (PP) Woven Sacks for Packing 50 Kg Sugar as per IS 14968:2015

S. No.	Description	Parameters
1	Product name	Milky White Polypropylene (PP) woven Bag for packing of 50 Kg sugar, made with virgin Food Grade Material, double folded double stitched. Liner loosely inserted and hammed at the top
2	Reference Standards	1. IS 14968: 2015 - Polypropylene (PP) Woven Sacks for Packing 50 Kg Sugar.
		2. IS 10910 - Polyproplene Granuels.
		3. is 10789 - Chain Stitching
3	Bag Size	590 mm x 900 m, tol +/- 10 mm
4	Liner Size	610 mm x 960 mm, tol +/-10 mm
5	Stacking height	Bags must be stacked at 25 feet height
6	Drop Impact Testing of Filled Sacks	The filled sacks when tested for drop impact strength from the height of 1.8 meter min- 4 times repeatedly
7	Raw Material Grade	For Woven Fabric : Vergin Polypropelene Granuels, Relince Grade H030SG or IOCL Grade 1030RG or Equavelent
		Liner : HM PP IOCL Grade 003F49 or Haldin Polymer Grade F5400 or Equavelent
		Thread : Polypropelyne Multifilament Yarn 1000 Denier
8	Mass of PP bag	125 gms . tol +/- 6% gm
9	Mass of Liner (LDPE/LLDPE/HMHDPE)	35 gms. tol +/- 2gms
10	Average Breaking strength of fabric, Min (Ravelled Strip method) Newton (Kgf), lengthwise as well as width wise The Test Must be conducted at 27 ^{0} C+- 5 C Temprature & Humidity at 65 +- 2 % as per IS 6359	900 Newton (91.8 kgf)
11	Average breaking strength of Bottom Seam, Min. (Strip method) Newton (kgf) The Test Must be conducted at 27 ^{0} C+- 5 C Temprature & Humidity at 65 +- 2 % as per IS 6359.	400 Newton (40.8 kgf)
12	Elongation at Break of Fabric(Ravelled strip method), lengthwise as well as width wise The Test Must be conducted at 27^{0} C+- 5 C Temprature & Humidity at 65 +- 2 % as per IS 6359	20% tol +-5
13	Mesh - Ends and picks- sq decimeter	48 nos X 48 nos tol +/- 2 sq decimeter (12 nos x 12 nos sq inch)
14	Ash Content (Calcium Carbonate(Caco3)) at Temprature 550 ^{0} +- 10 ^{0} C	2.2% (max.)
15	Printing over bags (One side/ both side)	With FOOD GRADE, water resistance INK as per printing matter provided by us.
16	PP Recycle Logo Must be printed over bag	
17	Manufacturer LOGO is essential for Identification	Manufacture logo shoud not increase more than 25 x 25 sq mm and it should be placed on right - bottom of bags on printing side.
18	Bale Size	500 Nos Bag in Each Bale
19	Bale Weight	82.50 Kg tol. +- 3%
20	Price Variation Formula	Basic Price of Bag will be subject to price variation formula. The PP Base price of IOCL(Government of India Undertaking) will be considered on the date of Dispatch to set new prices as under.
		Pn=Pq+ ((Rn-Rq)*w/1000)
		Pn=New price of bag in Rs/bag.
		Pq=Basic Agreed price of bag in Rs./bag.
		w=weight of bag in grams.
21	Test certificates	Manufacturer Test certificate is required for every supplies made as per our prescribed formet
22	Mandatory Certifications/accendition requirements	1. Quality system ISO-9001 Accendition 2. BIS certification for any food grade packaging bags

HIGH DENSITY POLYTHYLENE (HDPE)/POLYPROPYLENE (PP) WOVEN SACKS FOR PACKAGING 50 Kg SUGAR DETAIL SPECIFICATION (BIS 14968:2015)
(First Revision)

1	SCOPE - This standard prescribes requirements of HDPE/PP woven sacks for packaging sugar.
2	REFERENCES - The standard listed in Annexure 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 Annexure A.
3	TYPES The sack shall be depending upon the capacity: 50 Kg.
4	MANUFACTURE
4.1	RAW Material The high density polythylene (HDPE) or polypropylene (PP) used for manufacture of tape shall confirm to the requirements specified in IS 10146 or IS 10910 respectively. The raw material composition mix to be used for manufacturing of the HDPE/PP woven sacks shall be as agreed to between the buyer and the seller.
4.2	Fabric The fabric used in the manufacture of HDPE/PP woven sacks shall be woven as a tube on circular looms from HDPE/PP taps having width of 2.5 mm (tolerance of ± 10 percent) conforming to IS 6192 and IS 11197 respectively and linear density of 111 tex (1000 denier) for 50 Kg. sugar bags. The denier of HDPE/PP tape used in the manufacture of woven fabric/sacks shall be subjected to the following tolerances: a) ± 10 percent on individual value, and b) ± 5 percent on average. The construction particulars of fabric shall be as given in Table 1.
4.3	Sacks- The sacks shall be produced from tubular fabric woven as tube on a circular loom and cut to the required length.
4.3.1	Bottom Seam The stitching of bottom seam shall be done with two rows of chain stitch (see IS 10789). The two rows of stitches shall be separated from each other by minimum 5 mm and the outer stitch shall be minimum 8mm from the outer edge of the sacks. The stitching shall be done with double fold over seam to a depth of minimum 25mm, so that the stitches pass through a minimum of six layers of the fabric. The number of stitches/dm shall be 14±2. The meterial used for stitching shall be UV stabilized HDPE/PP tape as used in the fabric or any other UV stabilized thread/multifilament yarn suitable for the purpose. The stitching shall be uniform without any loose thread or knot.
4.3.2	Mouth- The completely open mouth of the sacks shall be hemmed with a fold of minimum 5mm and tapes shall not frey. The loose liner, if required, shall be inserted inside the sack and shall be hemmed into the mouth with single hem.
4.4	Liner-If required by the buyer, the unlaminated sacks shall be provided with a loose liner of food grade virgin LDPE/LLDPE/HMHDPE/PP conforming to IS 10146 or IS 10910. The nass of the loose liner shall be 35±2 g. The width of the loose liner shall be at least 20mm more than the specified width of the sack and the length of the liner at least 50mm more than the specified length of sack. The bottom seam of the loose liner shall be at least 25mm from the bottom edge.
4.4.1	The liner shall be free from pin holes (except for air removal holes), patches, tear, blisters and any other visible defects.

4.5	Capacity- The sack shall have the nominal capacity of 50 Kg.
5	REQUIREMENTS
5.1	Mass of Bale- The mass of bale of sacks (excluding packaging materials) shall be within ±3 percent of the mass calculatd by multiplying the number of sacks with the mass of sack specified in Table 1.
5.2	The sacks shall conform to the requirements specified in Table1.
6	PRINTING, PACKAGING AND MARKING
6.1	Printing on Sacks-The sacks shall be printed with food grade printing inks and with identification mark of sack manufacturer along with the information as required by the buyer.
6.2	Packaging- 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 or multiple thereof.
6.3	Marking- The bales shall be marked with the followings 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: g) Identification Mark, and h) Any other information as required by the law in force. NOTE- Each sack shall be compulsorily marked with visible recycling logo as given below at a space on bottom of the bag compatible with the art work of the buyer for printing the sack and on the bale.
6.4	BIS Certification Marking- The sacks may also be marked with the Standard Mark.
6.4.1	The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of 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.
7	ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING- Prior to test, the specimens shall be conditioned to moisture equilibrium from dry side in the standard atmoshere of 65±2 percent relative humidity and 27 ± 2°C temperature as laid down in IS 6359.
8	SAMPLING AND CRITERIA FOR CONFORMITY
8.1	Lot-All the sacks of the same construction in a consignment 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 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 2 and col 3 of the Table 2. The number of sacks to be selected from the bales sampled shall be in accordance with col 4 of Table 2 for visual inspection, dimensions, ends, picks and mass requirements and shall be accordance with col 5 of Table 2 for breaking strength of fabric before exposing to UV radiation, breaking strength of bottom seam and percent elongation at break requirements. The samples should be selected in accordance with col 6 of Table 2 for determination of breaking strength of fabric after UV-radiation exposure and ash content.
8.4	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 inspections, ends, picks and dimensions in up to 10 percents of the sample size subject to rounding off the fraction to next higher integer. b) None of the sack or bale of 500 sacks weighs less than the respective lower specified limit after allowing tolerance of ± 6 percent on individual sack and ± 3 percent on a bale of 500 sacks, higher can be accepted. c) The average breaking strength of fabric in both lengthwise and widthwise is not less than the value specified and none of the individual bag value is more than 10 percent below the specified value. The sample s selected for breaking strength tests shall be free from defects in visual inspection, dimensions, ends, picks and mass requirements. d) The average breaking strength of fabric at bottom seam is not less than the value specified and none of the individual bag value is more than 10 percent below the specified value. The samples selected for bottom seam breaking strength tests shall be free from defects in visual inspection, dimensions, ends, picks and mass requirements and test carried on the center portion. e) None of the HDPE/PP sack samples after exposing to UV-radiation and weathering shall have breaking strength less than 50 percent of the original value. f) None of the sample sacks shall have percentage elongation and ash content outside the specified range.

Requirements of HDPE/PP Woven Sacks for Packaging Sugar
(Table 1)

S.N.	Characteristic	Requirement	Tolerance	Method of Test, Ref to
i	Capacity, Kg	50	-	-
ii	Dimesnsions (see Notes 1 and 2) (a) Inside Length, mm (b) Inside width, mm	900 590	+ 20 - 10	Annex B
iii	Ends per dm	48	±2	Annex B
iv	Picks per dm	48	±2	Annex B
v	(a) Mass of unlaminated sack, g (see Note 3) (b) Mass of the sack with liner, g	125 160	± 6 percent -	IS 1964
vi	Average breaking Strength of fabric (Ravelled strip method, 325 mmX70mm) Min, N^2 Kgf) (a) Lengthwise (b) Widthwise	900 (91.8) 900 (91.8)	-	IS 1969 (Part 1)
vii	Minimum breaking strength of bottom seam (Ravelled strip method), Min N^2) (kgf),	400 (40.8)	-	IS 9030
viii	Elongation at break of fabric, (Ravelled strip method, percent; (a) Lengthwise (b) Widthwise	20 20	±5 ±5	IS 1969 (Part 1)
ix	Average breaking strength and elongation at break of UV stabilized HDPE/PP fabric after been exposed to UV radiation and weathering, Min, (kgf)	50% of original vlaue	-	Annex C
x	Ash content, Max, Percent	2.2	-	Annex D

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. Bag manufacture shall provide suitable printed marking on the sack as guideline for top folding and stitching.

2. The HDPE/PP Woven sacks of specified dimension are suitable for packaging of sugar.

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

4. The mass of sacks shall be calculated by the method given in Annex E and same is given for guidance only.

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

2) 1 N =0.102 kgf (approximately).

Sample Size and Criteria for Conformity

(Table 2)

Sr. No.	Number of HDPE/PP Sacks in a Lot	No of Bales to be sampled	Sample Size for Visual Inspection, Dimensions, Ends, Picks and Mass Requirements	Sample Size for Breaking Strength fo HDPE/PP Fabric before Exposing to UV-Radiation, Breaking Strength of Seam and Elongation at Break Requirements	Sample Size Breaking Strength of HDPE/PP Fabric after Exposing to UV-Radiation Requirements and Ash Content.
i	up to 25000	3	12	8	1
ii	25001 to 50000	5	20	10	2
iii	50001 to 100000	8	32	13	3
iv	100001 and above	12	48	18	4

Annexure A

	IS NO. 1964:2001 Textiles - Methods for determination of mass per unit length and mass per area of fabrics (Second revision)
	1969 (Part 1):2009 Textiles- Tesnsile properties of fabrics -Determination of miximum force and elongation at maximum force: Part 1 strip method (Third 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.
	10146:1982 Specification of polythylence for its safe use in contact to foodstuffs, pharmaceuticals and drinking water
	10789:2000 Textiles - Stitch types- Classification and terminology (first revision)
	10910:1984 Polypropylene and its copolymer for its safe use in contact with foodsuffs, pharmaceuticals and drinking water
	11197:1985 Specification for monoaxially oriented polypropylene tapes.

Annexure B

METHOD OF TEST FOR LENGTH, WIDTH, ENDS AND PICKS PER DECIMETRE

B-1 METHOD OF TEST FOR LENGTH AND WIDTH

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

B-1 METHOD OF TEST FOR ENDS AND PIKS PER DECIMETRE

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 onec, Determine the averange ends/dm and picks/dm of each sack under test.

Annexure C

UV -RESISTANCE TEST

C-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 C-2 and C-3.

C-2 TEST CONDITION

The test shall be carried out with fluorescent UV-lamp Type B (313 nm or its equivalent).

The duration of the test shall be 192 h (that is, eight days) in continuous mode.

The test cycle shall be : 8 h at 60 ± 3°C with UV-radiation alternating with 4 h at 50 ± 3°C with condensation. Irradiance level throughout the test shall be maintained at 0.63 W/m2.

C-3 TEST PROCEDURE

C-3.1 Determine the original average breaking strength of fabric as per the test method specified in IS 1969 (Part 1).

C-3.2Expose the specimens alternately to ultraviolet light and condensation in respective test cycle in continuous mode for total 192 h.

The type of fluorescent UV-lamp, the tuning of the UV and condensation exposure and the temperature of the UV exposure and condensation shall be specified in C-2.

C-3.3 Determine the average breaking strength of the fabric separately after UV exposure as mentioned above.

C-3.4

Determine the percent retention of original strength as follows:

Percent retention of original
breaking strength = b/a X 100
where
a = average breaking stength before UV exposure as obtained in C-3.1 and
b= average breaking stength after UV exposure as obtained in C-3.3

NOTES

1. The UV source is a array of fluorescent lamps (with lamp emission concentracted in the UV range).

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

Annexure D

DETERMINATION OF ASH CONTENT

	D-1 PRINCIPLE The procedure is used to find out the inorganic residue in raffia tape/fabric sample by ashing it in muffle furnace. A weighed amount of tape/fabric sample is heated to 550°C. The polymer sample (organic portion) is burnt at 550°C until constant mass of inorganic matter is obtained. The residue (inorganic matter) is reported in terms of percent of ash content in a given sample.
	D-2 APPARATUS
	D-2.1 Weighing Balance, accurate to 0.001 g.
	D-2.2 Silica Crucibles, Sufficient volume to accommodate 30 g of sample in such a way that level of the sample after filling the crucible does not cross half the height of crucible.
	D-2.3. Bunsen Burner
	D-2.4 Silica Triangle and Tripod
	D-2.5 Muffle Furnace, Capable of being controlled thermostatically at 550 ± 10°C.
	D-2.6 Desicator, containing an effective drying agent (for example silica gel) the does not react chemically with ash components.
	D-2.7 Gloves and Crucible Holder
	D-3 SAFETY
	D-3.1 Burn the sample in an effectively ventilated hood.
	D-3.2 Keep the hood closed and do not inhale the fumes of combustion.
	D-3.3 Water gloves and use sample (crucible) holder, to introduce crucible in the furnace.
	D-3.4 Sample should be folded properly to accommodate it in silica crucible.
	D-4 PROCEDURE
	D-4.1 Heat the clean crucible at 550 ± 10°C for 10 to 15 min and cool it in a desicator.
	D-4.2 Weigh the empty crucible to nearest 0.001 g.
	D-4.3 Weigh 30 ± 2 g of raffia tape/fabric sample in the crucible (nearest to 0.001 g).
	D-4.4 Heat the crucible directly on burner so that the sample burns slowly and loss of ash is avoided. Countinue burning until no more smoke is evolved.
	D-4.5 Transfer the crucible in the muffle furnace, which is already maintained at approximately 550°C and keep the crucible inside for about 2 h.
	D-4.6 Remove the crucible from the furnace and cool it to the room temperature in a desicator. Weigh it and record the weight to accuracy of 0.001 g.
	D-4.7 Keep the crucible in the muffle furnace for another 30 min, cool in a desicator and weigh again. Repeat the procedure until mass is obtained.
	D-5 CALCULATION
	Percent ash content = Weight of ash/Weight of raffia fabric or tape sample X 100

AMENDMENT NO. 5 FEBRUARY 2023

TO

IS 14968 : 2015 TEXTILES — HIGH DENSITY POLYETHYLENE (HDPE)/ POLYPROPYLENE (PP) WOVEN SACKS FOR PACKAGING 50 kg/25 kg SUGAR — SPECIFICATION

(First Revision)

[*Page* 2, *Table* 1, *Sl No.* (v), (b), *col* (2) to (6)] — Substitute the following for the existing:

'b) Mass of the sack with liner, g				IS 1964
- PP liner	179	97	$^{+6}_{-4}$ percent	
- LDPE/LLDPE liner	180	98	$^{+6}_{-4}$ percent	
- HMHDPE liner	182	99	$^{+6}_{-4}$ percent'	

(*Page* 1, *Clause* **4.3.1**, *Para 2, first sentence*) — Substitute the following for the existing:

'For UV stabilized sacks, the material for stitching shall be UV stabilized HDPE/PP tape as used in the fabric or any other UV stabilized thread/multifilament yarn suitable for the purpose.'

[*Page* 2, *Table* 1, *Sl No.* (ix), *see also amendment no.* 2] — Delete.

[*Page* 2, *Table* 1, *Sl No.* (x)] — Substitute the following for the existing:

'x) Ash content, *Max*, percent				Annex D
a) For UV stabilized sacks	2.2	2.2	—	
b) For non-UV stabilized sacks	6	6	— '	

(*Page* 2, *Clause* **5.2**) — Insert the following clause at the end:

'5.3 UV Resistance

If agreed to between the buyer and the seller, sacks shall be manufactured from UV stabilized HDPE/PP material. The woven fabric made from UV stabilized tapes shall have minimum 50 percent retention of the original breaking strength, when tested after the same has been exposed to UV radiation and accelerated weathering as per the test method given in Annex C.'

(TXD 23)

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