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PAKISTAN STANDARD

**POLYPROPYLENE WOVEN LAMINATED
HERMITECALLY SEALED BLOCK BOTTOM
VALVE SACKS FOR PACKING OF CEMENT.
(2ND REVISION).**



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PAKISTAN STANDARDS & QUALITY CONTROL AUTHORITY

**Standards Development Centre,
PSQCA Complex ST 7/A, Block-3,
Scheme No. 36, Gulistan-e-Johar,
Karachi.**

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10.	Mr. Kanwar M. Usamn	Director/JS (p), RD & A Cell Ministry of Textile Industry 1 st Floor, Evacuee Trust Complex Aga Khan Road, F-5/1 Islamabad.

11.	General Manager (CSD)	Trading Corporation of Pakistan Ltd Finance & Trade Centre, 4 th & 5 th floor Shahrah-e-Faisal Karachi-75350
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16.	Mr. Muhammad Aleem Ahmed	P.C.S.I.R. Laboratories Complex Off University Road, Karachi-75280
17.	Mr. Zafar-ur-Rahman	Directorate of Industries & Commerce (Govt. of Baluchistan) Sirki Road Quetta-87550
18.	Mr. Muhammad Salim Latif	Directorate of Industries & Mineral Department Poonch House, Multan Road Lahore-54500
19.	Mr. S. Sabir Ali	S. R. Laboratories. Suit # 17, S. P. Chambers. S. I. T. E. Karachi-75600
20.	Mr. Irfan Amjad	Margala Packages & Allied Industries (Pvt) Ltd Naqi Arcade Shahrah-e-Quaid-e-Azam Lahore
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22.	Director	Punjab Food Department 2-Bank Road, Lahore
23.	Chief Inspector	Inspectorate Army Stores & Clothing Stadium Road, P.O. Tufailnagar Karachi-75260
24.	Mr. Shanshah Babar,	Assistant Director (Food Agro) Trade Development Authority of Pakistan FTC Building, Room no. 515, Block – A Sh-e-Faisal, Karachi.
25.	Mr. Hamza Ali Chandio	Senior Instructor Pak-Swedish Institute of Technology Quaidabad, Landhi Karachi-75120
26.	Naseem Azhar	Quality Control Centre PSQCA Complex Karachi.
27.	Haji Muhammad Yousaf,	Chairman PFMA, Southern Zone 1 (Sindh) M/S Karachi Flour Mills, Plot No. B – 1, Scheme 33, Superhighway S.I.T.E, Karachi.
28.	Mian Muhammad Riaz,	Chairman PFMA, Northern Zone 1 (Punjab) M/S New Punjab Flour Mills (Pvt.) Ltd., G.T Road Ferozewala, Sheikhupura.
	SECRETARIAT	
29.	Mr. Sajid Mian Bhutto Asstt. Director (Textile)	PSQCA Complex Plot # St-7A, Block-3, Scheme-36, Gulistan-e-Jauhar, Karachi.

PAKISTAN STANDARD SPECIFICATION
FOR
POLYPROPYLENE WOVEN LAMINATED HERMETICALLY SEALED BLOCK
BOTTOM VALVE SACKS FOR PACKING CEMENT

0. FOREWORD:

- 0.1 This Pakistan Standard was adopted by the Standards Development Centre, Pakistan Standards and Quality Control Authority (PSQCA) on 21st December, 2017, endorsement by National Standards Committee for (Textile). The draft having been finalized by the Technical Committee for Synthetic Textile (Bags & Cordages) TC-15.
- 0.2 This standard was previously established in 2008 and then in 2014; the committee felt it necessary to revise in the light of latest development in the industry.
- 0.3 In drawing up this standard the views of the consumers, manufacturers, traders, testing authorities, academia and the technologists have been taken in to consideration by the technical committee the need for international co-ordination of standard enforced in different countries of the world for promotion and easy flow of international trade has been kept in view. The development of standard is a continuous process and therefore, it is hoped to review this standard periodical on the basis of experience gained and studies made.
- 0.4 In order to keep abreast of the progress in industry the Pakistan Standards are subject to periodical review; suggestions for improvement shall always be welcomed and put up to the relevant committee for its consideration.
- 0.5 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 rounded off in accordance with PS: 103 “Methods and rules for rounding off numerical values”.

1. SCOPE:

- 1.1 This standard prescribes the requirements of polypropylene woven laminated hermetically sealed block bottom valve sacks for packing cement.

2. TESTING:

- 2.1 Testing of all samples shall be carried out in accordance with PS: ISO 139 i.e. temperature $27 \pm 2^{\circ}\text{C}$.

3. MANUFACTURE:

- 3.1 *Fabric:* The fabric used in the manufacture of polypropylene woven laminated hermetically sealed block bottom valve sacks for packing cement shall be woven from polypropylene tapes.

The maximum width of tapes used for making fabric shall be 4 mm and the linear density of fabric shall be mentioned in Table – I. The breaking strength of the fabric shall be so adjusted that the sacks woven out of it conform to the requirements prescribed in Table – I.

3.2 **Sacks:** The sack shall produce from fabric woven as a tube 3.3 and cut to the required length or converted from woven material and bottom and top shall be done sealed by machine pressed as mentioned in Table – I.

3.3 **Tubular Woven:** The sack tube is woven on circular looms. Alternatively, the sack tube may be woven on a flatbed loom, which effectively weaves two layers of fabrics. The weft is passed via the shuttle through each in such a way that it forms a tube in which the weft is continuous around the tube so formed. When this method used the weft direction tape lies in the transverse direction of the finished sack and a thin polymer film should be laminated outside of tabular woven sacks forming the walls of a sack.

3.4 **Valve for filling of sacks:** The valve shall be formed at one corner of the top of the sack for filling of intended commodity.

3 REQUIREMENTS:

4.1 The Polypropylene woven laminated hermetically sealed block bottom valve sacks for packing cement shall conform to the requirements as laid down in Table – I and Table – II.

4.2 **Breaking Strength:** The breaking strength of fabric and dimension of sacks shall be given in Table – I and Table – II respectively.

4.3 **Affixing of Top/Bottom Patches:** Top/Bottom patches should be affixed with hot air instead of pasting and stitching.

4.4 **Mass:** The mass per square meter (wt. / m²) of laminated fabric as given in Table – I.

4.5 **UV-resistance test:** It is desirable but not mandatory that the sacks are stabilized for U/V light. The procedure is described in Appendix – A.

TABLE – I
PARTICULARS OF POLYPROPYLENE WOVEN LAMINATED HERMETICALLY
SEALED BLOCK BOTTOM VALVE SACKS FOR PACKING CEMENT

S.No.	CHARACTERISTICS	REQUIREMENTS			TOLERANCE	METHOD OF TEST
		80 grams Bag	65 grams Bag	60 grams Bag		
1.	Mass / square meter (gms)	92	75	69	±5%	PS:ISO 3801
2.	Density / dm (inch)				±5%	PS:ISO 7211/2
	a. Ends	24.5 (6.2)	28.5 (7.2)	33 (8.4)		
	b. Picks	24.5 (6.2)	28 (7.1)	32 (8.1)		
3.	Minimum Breaking Strength on 5x20 cm strip (Kgs)				XXX	PS:ISO 13934/1
	a. Warp	56	55	50		
	b. Weft	52	50	45		
4.	Denier of tape	1250	850	670	±5%	PS:ISO 7211/5
5.	Thickness of fabric including laminated film (Micron)	240 - 300	200- 260	180 -245	XXX	PS:ISO 2286/3
6.	Nozzle Dia *(mm)	90 – 125	90 – 125	90 – 125	XXX	PS:ISO 3932
7.	Top bottom width *(mm)	90 – 125	90 – 125	90 – 125	XXX	PS:ISO 3932
8.	Air permeability *(NL/h)	150 – 600	150 – 600	150 – 600	XXX	PS:ISO 9237
	*(Nm ³ /h)	50 – 130	50 – 130	50 – 130		

* As agreed with mutual understanding between the buyer and the seller for special specifications.

TABLE – II
DIMENSIONS OF POLYPROPYLENE WOVEN LAMINATED HERMETICALLY
SEALED BLOCK BOTTOM VALVE SACKS FOR PACKING CEMENT

Dimensions in mm (inch)	REQUIREMENTS			METHOD OF TEST
	50 kg	40 kg	25 kg	
a. Outside Length	590 – 665 (23 – 26)	490 – 570 (19.2 – 22.4)	460 – 480 (18.1 – 18.8)	PS: ISO 22198
b. Outside Width	495 – 505 (19.4 – 19.8)	465 – 505 (18.3 – 19.8)	380 – 400 (14.9 – 15.7)	

3.5 **Drop test:** The drop test shall be carried out in accordance with PS: 4879 and the related parameter are prescribed in Appendix – B.

4 PRINTING, PACKING AND MARKING:

5.1 The sacks shall be marked within information as required by the buyer using suitable inks, and printing should be clear without any major smudging and missed portions. Inks should be non-fading water resistance.

Note: *The common practice of marking involves the use of silk screens or stencil for printing the matter when the number of sack ordered is small. When large numbers of sacks are required, the accepted method is flex-printing. The inks found suitable for printing are those based on polyamide resin. The shade of the inks should be uniform with normal machine tolerance.*

5.1.1 20 sacks will be tied to form a bundle and these bundles will be gathered so that 500 sacks shall be packed to constitute a bale, which shall be formed by using a sheet of HDPE or PP woven fabric or any other suitable material and suitably secured.

5.2 The polypropylene woven laminated hermetically sealed block bottom valve sacks may also be marked with Standard PS Mark.

Note: *The use of the Standard Mark is governed by the provision of the section XIII of PSQCA Act VI of 1996 and details of conditions, under which a License for the use of Standard Mark may be granted to manufacturers or processors, may be obtained from Director (Conformity Assessment) Standard Development Centre PSQCA.*

5.2.1 Each bale shall be marked with the following :

- i) Name of the inside material,
- ii) Net and gross weight of the material,
- iii) Name of the mill, initials or trade mark,
- iv) Date of manufacture/year,
- v) Date of expiry,
- vi) Any other information required by the buyer or by the law enforce,

6 SAMPLING AND CRITERIA FOR CONFORMITY:

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

6.2 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.

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

TABLE – III
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 requirements.
(1)	(2)	(3)	(4)
Up to 12500	3	13	8
12501 to 25000	5	20	8
25001 to 50000	8	32	13
50001 and above	12	50	20

6.4 ***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 width wise directions is not less than the value specified and none of the individual value is more than 10 percent below.

APPENDIX – A.

- A-1 **UV- resistance test:** The determination of the fluorescent of UV- radiation and weathering on the breaking strength of woven polypropylene fabric shall be carried out in accordance with ASTM G 53.
- A-2 **Test procedure:** The test shall be carried out with fluorescent UV –Lamp type – B. The duration of the test shall be 144 hours (i.e. 6 days). The test cycle shall be 8 hours at +60⁰C with UV – radiation, alternating with 4 hours +50 ⁰C with consideration.
- A-3 Criteria for passing the UV-resistance test. After the test, the breaking strength of the tested material shall be at least 50% of the original breaking strength.

APPENDIX – B.

- B-1. **Drop test:** The drop test of filled sack shall be carried out on three sacks and shall comprise of following sequence.
- a) Flat dropping:
- B-2 Flat dropping: The sack shall be dropped from a height of 1800 mm twice on one flat face and twice on the opposite flat face.
- B-3 Carried for passing the drop test: After each drop there shall be no rupture or less of contacts. A slight discharge e.g. from closures, upon impact shall not be considered a failure of the sack provided that no further leakage occurs after the sack has been raised clear of the ground.

REFERENCES

1.	PS: 103	Method and rules for rounded off numerical value.
2.	PS: 4879	Cotton, jute and polypropylene woven sacks-Method of Drop test.
3.	PS ISO: 139	Standard atmospheres for conditioning and testing.
4.	PS ISO: 2286 – 3	Method for determination of thickness.
5.	PS ISO: 3801	Determination of mass per unit length and mass per unit area.
6.	PS ISO: 7211 – 2	Determination of number of thread per unit length.
7.	PS ISO: 7211 – 5	Determination of linear density of yarn removed from fabric.
8.	PS ISO: 9237	Determination of the permeability of fabric to air.
9.	PS ISO: 13934 – 1	Tensile properties of fabrics-Determination of maximum force elongation at maximum force using the strip method.
10.	PS ISO: 22198	Textile-fabric-Determination of width & length.