

PS: 2958-2017 (R)

ICS No. 55.080:83.140.99:65.080

PAKISTAN STANDARD

**POLYPROPYLENE WOVN SACKS FOR PACKING
FERTILIZERS
(2ND REVISION).**



(ALL RIGHTS RESERVED)

**PAKISTAN STANDARDS & QUALITY CONTROL AUTHORITY
Standards Development Centre,
PSQCA Complex ST 7/A, Block-3,
Scheme No. 36, Gulistan-e-Johar,
Karachi.**

MEMBER LIST OF TECHNICAL COMMITTEE
FOR
SYNTHETIC TEXTILES (BAGS & CORDAGES) (TC-15)

S.No.	CHAIRMAN	ORGANIZATION
1.	Mr. Iskander M. Khan	Premier Group of Companies, 20-A, Markaz F-7, Islamabad.
	MEMBERS	
2.	Mr. Asad Arfeen	Arfeen Industries, 311 – West Canal, Bank Road, Lahore.
3.	Mr. Abdul Samad Lathia	Prime Plastics (Pvt) Ltd Suit # 212, 2 nd floor Progressive Plaza Beaumont Road Karachi-75530.
4.	Syed Mudassir Zaidi	Omni Polymer Packages (Pvt) Ltd 1 st floor, Block-3, Hockey Club of Pakistan Stadium. Liaquat Barracks Karachi-75350
5.	Mr. Shoaib Abdullah	Storsack (Pvt) Ltd 501- 5 th floor Business Avenue Main Shahrah-e-Faisal Karachi.
6.	Mr. Adnan Khan	Amin Fabrics Ltd Ocean Centre 40-Talpur Road Karachi.
7.	Mian Iftikhar	Polypack (Pvt) Ltd 4-km Raiwind Magana Road Lahore.
8.	G. M. (Procurements)	Rice Export Corporation of Pakistan Finance & Trade Centre Shahrah-e-Faisal Karachi-75350.
9.	Mr. Shaukat Ahmed	Mian Nazir Sons Industries (Pvt) Ltd. Business Centre, 301-307, 3 rd floor, I. I. Chundrigar Road, Karachi-74000
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
12.	Textile Commissioner	Textile Commissioner's Organization Govt. of Pakistan Kandawala Building M.A. Jinnah Road Karachi-74400
13.	Secretary	Rice Exporters Association of Pakistan Room No. 405-421, 4 th Executive floor Sadiq Plaza The Mall Lahore.
14.	D. G. (Food)	Directorate General Foods Ministry of Food & Agriculture Govt. of Pakistan Block-66, Pak. Sectt. Saddar, Karachi-74200
15.	G. M. (Commercial)	PASSCO 54-Lawrance Road Lahore.
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
21.	Secretary	Pakistan Polypropylene Woven Sacks Association 20-A, Markaz F-7, Islamabad

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 WOVN SACKS FOR PACKING FERTILIZERS**

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.
- 0.1 This Standard was first published in 1991 and then in 2009, since then many suggestions were received for improvements which after the consideration have been incorporated in this revision.
- 0.2 Polypropylene bags have become popular in Pakistan due to its cheapness and strong-ness qualities for packing granular materials. Although it is a new technology introduces and is in infancy, even then the necessity of a standard was felt and this is being advantage.
- 0.3 In order to keep abreast for the progress in industry the Pakistan Standard are subject to periodically reviews suggestions for improvements shall always be welcomed and put up to the relevant committee for its consideration.
- 0.4 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 PS: 103 "Methods and rules for rounding off numerical value". The number of significant places retained in the rounded off value should be the same as that of the specific value of the standard.

1. SCOPE:

- 1.1 This standard prescribed the requirements of polypropylene woven sacks suitable for packing of different types of fertilizers.

2. ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING:

- 2.1 Before testing all samples shall be conditioned in accordance with PS: ISO 139 2008 i.e. $65 \pm 2\%$ relative humidity and 20 ± 2 °C temperature.
- 2.2 The period of conditioning of the samples shall be not less than 4 hours.

3. TERMINOLOGY: For the purpose of this standard, the following definitions shall apply:

- 3.1 *Flat Sack:* A sack manufactured from a flat tube.

4. MANUFACTURE:

- 4.1 The fabric used in the manufacture of polypropylene woven sacks for packing fertilizers shall be woven from polypropylene tapes. The minimum width of tapes used for making fabric shall be 2.5 mm. The cloth shall be evenly woven and generally free from rips, tears, and mended area.
- 4.2 *Sacks:* The sacks shall be produced from fabric woven as a tube (4.3) and cut to the required length according to Table – 1 and Table – 2 or as agreed by seller and customers.
- 4.3 *Tubular Woven:* The sacks tube is woven on circular loom in continuous length. 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 way that it forms a tube in which the weft is continuous around the tube so formed. When this method used the weft direction tapes lies in the transverse direction of the finished sack.
- 4.4 *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 rows of chain stitches. PS ISO 4915. In case of two rows of stitches, the same shall be separated from each other by minimum 5mm and the outer row of the stitching/single row stitching shall be minimum 8mm from the outer edge of the sack. The stitching shall be done with a fold over seam to a depth of minimum 25mm so that the stitches pass through minimum four layers of the fabric. The number of stitches per dm shall be 14 ± 2 .
- 4.4.1 The stitching shall be uniform and without any loose thread or knot.
- 4.4.2 The stitching shall be done by polypropylene tape or any suitable thread heaving breaking strength suitable to achieve the specified seam strength.
- 4.5 *Mouth of the sacks:* The mouth of the sacks should be selvedged, hammed or heat cut, so that the tapes do not fray.
- 4.6 *Capacity:* The sack shall have a nominal capacity of holding 50kg Fertilizers.
- 4.7 *Lamination of the sack:* Before being made into a sack, the flat fabric, if required by the buyer may be laminated with low density polyethylene film of uniform thickness not less than 25 Micron. Alternatively, the sack may also be supplied with a loose liner of plastic materials such as L.L.D.P.E., HMHDPE, HDPE, and LDPE, polypropylene or PVC as required by the buyer. The thickness of the liner shall not be less than 40 Microns. The loose liner should at least be 10 percent more in length as well as width of the sack.
- 4.7.1 The lamination of liner shall be free from pin holes, patches tears, blisters and any other visible defects. The plastics material used for lamination or liner made of virgin material.

TABLE – 1
PARTICULARS OF POLYPROPYLENE WOVEN SACKS
FOR PACKING FERTILIZERS

S. NO.	Characteristics	Requirements	Tolerance	Method of Test
1.	Denier of Tape a) Warp b) Weft	940 940	±5 %	PS ISO: 7211 – 5
2.	Density / dm (Inch) [Min.] a) Ends b) Picks	40 (10) 40 (10)	XXX	PS ISO: 7211 – 2
3.	Weight / Sq. Meter (GSM) gm	95	±5 %	PS ISO 3801
4.	Breaking Strength on 5 x 20 cm strip kg [Min.] † a) Warp b) Weft	80 80	XXX	PS ISO: 13934 – 1
5.	Bursting Strength kg/cm ² [Min.] †	17	XXX	PS ISO: 13938 – 1
6.	Breaking Strength of Seam kg [Min.] †	30	XXX	PS ISO: 13935 – 1

* Plus, tolerance is up to infinity

† For guidance only

TABLE – 2
DIMENSIONS AND WEIGHT / BAG OF
POLYPROPYLENE WOVEN SACKS FOR PACKING FERTILIZERS

S. No.	Uses	Dimensions cm (Inch) [Min.]		Weight / bag (gm)
		Length	Width	
1.	Urea	102 (40)	56 (22)	100
2.	CAS / N.P	94 (37)	56 (22)	95
3.	Super Phosphate (DAP)	91 (36)	56 (22)	95
4.	Calcium/Ammonium Sulphate	99 (39)	48 (18.9)	95
5.	Sulphate of Potash	93 (36.6)	57 (22.4)	105
6.	Muriate of Potash	82 (32.2)	56 (22)	100
Tolerance		XXX		± 5 %
Method of test		PS ISO: 22198		PS ISO 3801

5. REQUIREMENTS:

5.1 The breaking load of fabric and seam shall be as given in Table – 1.

5.2 *Joint bags:* The sacks shall not be made from joint pieces.

5.3 *UV- resistance test:* It is desirable by the buyer and the seller that the sacks are stabilized for U/V light. The procedure is described in **Appendix – A.**

5.4 *Drop test:* It is desirable by the buyer and the seller that the drop test shall be carried according to PS: 4879 and the related parameters are prescribed in **Appendix – B.**

6. PACKING AND MARKING:

6.1 The sack shall be marked with information as required by the buyer using suitable ink and printing should be clear without any measure smudges or missed portions.

Note: The common practice of marking involves the use of silk screens or stencil for printing the matter when the number of sacks ordered is small. When large numbers of sacks are required, the normal 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.

6.2 100 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 using a layer HDPE or PP woven fabric or any other suitable material and secured.

6.3 Standard Mark: The Polypropylene woven sack for packing fertilizers may also be marked with Standard Mark PSQCA.

Note: The use of 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 purchasers, may be obtained from Director (Conformity Assessment) Standard Development Centre PSQCA Karachi.

7. LABELLING:

7.1 Each fertilizer bag shall be marked with the following or as per requirements by the buyer and the seller:

- i. Name of the manufacturer and initial or trade mark;
- ii. Type and Size of sacks;
- iii. Number of sacks;
- iv. Net and gross weight of the material;
- v. Date of manufacture/expiry of the material;
- vi. Any other information required by the buyer or the law enforce.

8. SAMPING AND CRITERIA OF 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 – 3. The number of sacks to be selected from the bales sampled shall be in accordance with col. 3 and 4 Of Table – 3.

TABLE – 3
SAMPLE SIZE AND CRITERIA FOR CONFORMITY

No. of Sacks in the Lot	No. of Bales to be sampled	Sample Size for Visual, Mass of Sack, Inspection, Dimensions, Density and Requirements	Sample Size for Breaking Strength and of base Fabric and Seam
(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

- 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 defectives 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 there of 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.
 - 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 25 kg, provided that average specified seam strength at top and bottom of all samples under test is 30 kg.

APPENDIX – A

- A – 1 *UV- resistance:* The determination of the influence of UV-radiation and weathering on the breaking strength of woven Polypropylene fabric shall be carried out in accordance with ASTM G 53-1998. The requirement may be matter of mutual agreement between the buyer sellers.
- 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 + 60 °C with UV-radiation, alternating with 4 hours + 50 °C 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 shall be carried out on three sacks and shall comprise the following sequences.
- a) Butt dropping
b) Flat dropping
- B – 2 **Butt dropping:** The sack shall be dropped from a height of 1.20 meter on the bottom of the sack.
- B – 3 **Flat dropping:** The sack shall be dropped from a height of 1.6 m twice on one flat face and twice on the opposite flat face.
- B – 4 **Criteria for passing the drop test:** After each drop, there shall be no rupture or loss of contacts. A slight discharge e.g. from closures, upon impact shall not be considered a failure of the sack provided that 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: 3801	Determination of mass per unit length and mass per unit area.
5	PS ISO: 4915	Stitch type-Classification & terminology.
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: 13934 – 1	Tensile properties of fabrics-Determination of maximum force elongation at maximum force using the strip method.
9	PS ISO: 13935 – 1	Seam Tensile properties of fabric and made-up textile article- Determination of maximum force to seam rupture using the strip method.
10	PS ISO: 13938 – 1	Bursting strength of fabrics-Hydraulic method for determination of bursting strength bursting distension.
11	PS ISO: 22198	Textile-fabric-Determination of width & length.