DEAS 2256: 2019

ICS nn.nnn.nn

EAST AFRICAN STANDARD

Woven polyolefin sacks (bags) for cement — Specification

EAST AFRICAN COMMUNITY

First Edition 2019

Contents

Page

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 061, Textiles, Textile products and Accessories

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Woven polyolefin sacks (bags) for cement — Specification

1 Scope

This draft East African Standard specifies the requirements for woven polyolefin sacks (bags) for packing cement

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3801, Textiles - Woven fabrics - Determination of mass per unit length and mass per unit area

ISO 13934-1, Textiles, tensile properties of fabrics Part 1: Determination of minimum force and elongation at maximum force using the strip method

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
woven polyolefin sack (bag)
a flexible container made from fabric manufactured from woven polyolefin tape yarns

3.2
woven polyolefin fabric
a sheet material woven from polyolefin tape yarns

3.3
polyolefin tape yarn
flat yarn having a high ratio of width to thickness composed of polyolefin polymer

3.4
polyolefin polymer
a linear polymer obtained by polymerization of an unsaturated hydrocarbon to give a linear saturated hydrocarbon. These are polyethylene and polypropylene

3.5
coated fabric
a fabric coated on one or both sides with a suitable polymer

3.6
degree of warp coverage
a value expressed as a percentage indicating the extent to which a unit area of fabric is covered with warp tapes

3.7
degree of weft coverage
a value expressed as percentage indicating the extent to which a unit area of a fabric is covered with weft tapes

3.8
gusset
fold inserted in the longitudinal sides of a tube or sack

3.9
gusseted sack
sack manufactured by forming a gusseted tube

3.10
flat sack
block sack made from a flat tube and formed into a block by end foldings

3.11
valve depth
length of the valve batch towards the inside of the valve mouth

3.11
valve height
diameter of the valve mouth

4 Requirement

4.1 Materials

4.1.1 Fabric

The fabric shall be woven from polyolefin tape yarns and shall be coated. The fabric shall be perforated

4.1.2 Stitching thread

The stitching thread where required shall be made from either polypropylene, or other material provided they are not adversely affected by the contents of the sack or by the expected climatic conditions in transit, storage and use.

4.2 Dimensions

The internal dimensions of the bag shall be as specified in Table 1.

4.3 Construction

4.3.1 Sack

The sack shall be produced either from material woven as a tube or from flat woven material and shall have perforations as specified in Table 1.

4.3.2 Degree of coverage

The degree of warp or weft coverage shall not be less than 100. This shall be determined in accordance with Appendix A of Annex E

4.3.3 Mass of the sack (bag)

The minimum mass of the sack (bag) shall be as specified in Table 1. A laminated bag shall have a mass not less than the sum of the bag proper and the coating.

4.3.4 Edge sealing

All raw-edges shall be sealed to prevent fraying.

4.3.5 Base closure

4.3.5.1 The base closure shall be made of a welded joint. A tubular fabric cut from a roll to a specified dimension, is folded by a machine, 5 cm on each side at the base to form an overlap of one centimetre.

4.3.5.2 A rectangular patch measuring 9.5 cm by 39 cm is pressed on the overlap by means of hot air and welded at the base to form a strong joint complying with the requirements of clause 4.6.

4.3.6 Longitudinal seams

Where longitudinal seams are used, they shall be either stitched or bonded and shall be such as to ensure compliance with the requirements of 4.5. All longitudinal seams shall be along the edge-fold except for bonded seams which shall be on the back face in the center, unless required to be off-set to accommodate printing.

4.3.6.1 Stitched seam

Where longitudinal seam is effected by a turned over and stitched seam, the turn-over shall be 2 cm minimum and the stitch line shall be 1 ± 0.3 cm from the outer edge of the seam so formed and shall pass through all the four thickness of the material.

4.3.6.2 Bonded seam (longitudinal)

Where the longitudinal seam is bonded, the edges of the material shall be overlapped 3 cm minimum and bonded with a width of bond of 1.5 cm minimum. The bond shall be such as to ensure compliance with the requirements of 4.6

4.4 Mouth

The mouth of the sack (bag) shall have a self-sealing valve and of dimensions specified in Table 1. The mouth shall be compost of a welded joint formed as in 4.3.5

4.5 Breaking strength

The minimum-breaking strength of the fabric shall be as specified in Table 1.

4.6 Breaking strength of welded joint (base closure)

The minimum-breaking strength of welded joint at the base and the mouth shall be as specified in Table 1.

4.7 Lamination

A bag may be made from a fabric laminated on the inner side. When visually examined, the lamination shall be even and uniform.

Table 1 — Requirements for polyolefin cement bag

Sl No	Characteristic		Requirement, 50 kg	Test method
i)	Dimensions of bag, cm min.	Length	62	Annex C
		Width	50	
ii)	Breaking strength, N min.	Warpway	600	
		Weftway	500	
iii)	Dimensions of valve, cm	Length	14.2 ± 0.5	Annex C
		Width	10 ± 0.5	
iv)	Number of perforations/cm	Warpway	3 ± 1	Annex A
		Weftway	3 ± 1	
v)	Joint strength, N min.		450	Annex B
vi)	Total mass of bag , g, min.		80	ISO 3801
vii)	Total mass of sacking, g/m², min.		90	ISO 3801

[a] For gusseted sacks, Length and width shall have a gusset of 11 cm.

[b] The speed of 200 mm/min shall be used.

5 Packaging

The sack (bags) shall be packed in bales of the agreed quantity. The bales shall be securely bound.

6 Marking

6.1 Marking on each sack (bag)

Each bag shall have an identification mark.

6.2 Marking on each bale

The following information shall be marked on each bale:

a) manufacturer's name and/or registered trade mark if any;

b) the inscription 'Polyolefin bags for cement of mass 50 kg';

c) number of pieces in the bale;

d) batch number/bale number;

e) country of manufacture; and

f) contract mass in kg

Annex A
(normative)

Determination of number of perforations per centimetre

A.1 Principle

The number of perforations on a specified area of a polyolefin fabric and visible within the aperture of a standard-counting glass are counted and recorded

A.2 Apparatus

A.2.2 Counting glass, aperture width shall be 2 ± 0.005 cm.

A.2.3 Flat bench

A.3 Procedure

Lay on a flat bench the fabric (A.2.2) and place the counting glass on the fabric so that one of the edges of its aperture is parallel to the weft tapes, count the number of perforations along the weft tapes. Repeat with one of the edges parallel to the warp tapes in a similar manner. For both warp way and weft directions, make five determinations each.

A.4 Calculation

Calculate the mean number of perforations per centimeter for each direction. The number of perforations per square centimeter is given by the product of the mean perforations of warp way and weft way.

A.5 Report

Report the value calculated in Clause A.4 as the number of perforations per cm or square cm

Annex B
(normative)

Determination of weld joint strength

B.1 Principle

A specimen of the weld joint is subjected to a tensile force on a tensile testing machine and the resultant force is recorded

B.2 Apparatus

B.2.1 Tensile testing machine

B.2.2 Metre rule

B.2.3 Pair of scissors

B.3 Test Specimens

Cut two specimens perpendicular to the line of the weld, of 50 mm by 350 mm from the base of the bag incorporating the weld joint.

B.4 Procedure

Test the weld joint strength in accordance with ISO 13934-1

Annex C
(normative)

Dimensions of bag

Spread each bag on flat surface so that there are no creases or folds.

C.1 Outside Dimensions – Two Dimensional Bag.

C.1.1 *Outside Length* — Measure the outside length of each bag to the nearest 0.1 cm in six different places (Three on the face and three on the back), from the bottom fold-line to the mouth, using a rule or tape measure graduated in centimetres.

The outside length of each bag is the average (arithmetic mean) of the six readings.

C.1.2 *Outside Width* — Measure the outside width of each bag to the nearest 0.1 cm in six different places (three on the face and three on the back) from the edge of one side seam to the edge of the other seam or fold-line (in case there is only one side seam), using a rule or tape measure graduated in centimetres

The outside width of each bag is the average (arithmetic mean) of the six readings.

C.2 Inside Dimensions — Two Dimensional Bag — Turn each bag inside out. Spread each bag on a flat surface so that there are no creases or wrinkles.

C.2.1 *Inside Length* — Fold the bag into half, from side to side and measure the length from the mouth to the stitching along the fold so formed, to the nearest 0.1 cm. Repeat the procedure for the other side of the bag and calculate the average inside length for each bag from the two readings.

C.2.2 *Inside width* — Fold the bag into half, from top to bottom and measure the width from the folded side to the stitching along the fold so formed, to the nearest 0.1 cm. Repeat the procedure for the other side of the bag and calculate the average inside width of each bag from the two readings.

C.3 Outside Dimensions – Three Dimensional Bag — Lay each bag on a flat surface. Fold the bottom of the bag and the two side-widths so that the bag assumes a flat two-dimensional state with the four corners of the bottom part lying on the same line and the two handles lying one on top of the other. Ensure that the side fold-lines so formed are in line and parallel to each other.

C.3.1 *Outside Length* — Measure the outside length of each bag to the nearest 0.1 cm in six different places (three on the face and three on the back) from the edge of one side seam (or fold line so formed as described above) to the other side-seam or fold-line, using a rule or tape measure graduated in centimetres.

The outside length of each bag is the average (arithmetic mean) of the six readings.

C.3.2 *Outside Width* — Measure the outside width of each bag to the nearest 0.1 cm in six different places (three on one side and three on the other side) from the ‘inside pocket’ fold-line to the edge of the side-seam or side fold-line, using a rule or tape measure graduated in centimetres.

The outside width of each bag is the average (arithmetic mean) of the six readings multiplied by two.

C.3.3 *Depth* — Measure the depth of each bag to the nearest 0.1 cm in six different places (two on each side) from the bottom stitch-line to the mouth, using a rule or tape measure graduated in centimetres.

The depth of each bag is the average (arithmetic mean) of the six readings.

C.4 Handle Dimensions — Lay the bag on a flat table, ensuring that there are no wrinkles.

C.4.1 *Span of the handle* — Measure the span of each handle to the nearest 0.1 cm, using a rule or tape measure graduated in centimetres. Repeat the same procedure for the handle on the other side of the bag.

The span of the handle for each bag is the average for the two readings.

C.4.2 *Height of the Handle loop* — With the specimen lying on a flat table without folds or wrinkles and the handle under no tension, measure the height of the handle loop to the nearest 0.1 cm from the mid-point of the handle-span to the appex of the loop. Repeat the procedure for the handle on the other side of the bag.

The height of the handle loop for each bag is the average of the two readings.

Annex D
(normative)

Total mass of bag

Determine the mass of each bag in the test sample to the nearest 1.0 g, using a weighing balance measuring to an accuracy of 0.1 g. Calculate the average mass of a bag. Denote this by 'M'.

D.1 CONTRACT MASS OF A BALE

Calculate the contract mass of a bale using the following formula:

$CM = M' \times N$

where,

CM = contract mass of a bale

M' = nominal mass of a bag.

N = total number of bags in the bale (test result from **3.3**).

D.2 CORRECT MASS OF BALE

Calculate the correct mass of a bale using the formula

$$CB = \frac{N \times M (100 + RA)}{(100 + R)}$$

where,

CB = correct mass of a bale

N = total number of bags in a bale (test result **3.3**)

M = average mass of a bag (test result **6**)

R = average moisture regain in a bag (test result from **13)**

RA = recommended moisture allowance

Annex E
(normative)

degree of warp or weft coverage

E.1 Mark out separately five distinct spaces (areas), each measuring 20 cm x 20 cm, on each sample of wrapping cloth.

E.2 Count the number of warp tapes within each space (area). Denote this by 'N'.

E.3 Count also the number of weft tapes within each space (area) and denote this by '*n*'.

E.4 Remove ten (10) warp tapes form each sample and measure the width of each tape to the nearest 0.10 mm. Calculate the mean warp tape width and denote this by '*a*'.

E.5 Remove also ten (10) weft tapes form each sample and measure the width for each tape to the nearest 0.10 mm. Calculate the mean weft tape width and denote the by '*b'* mm.

E.6 Determine the degree of warp coverage '*K*p' and weft covering *K*f as follow:

E.6.1 $K\text{p} = 1/5\ (Kp_1 + Kp_2 + Kp_3 + K\text{p}_4 + K\text{p}_5)$

where,

$K\text{p}$ = Degree of warp coverage for the sample and

$K\text{p}_1\ K\text{p}_2 \ldots K\text{p}_5$ = Degree of warp coverage for each marked space (area).

$K\text{pt} = 0.5\ Na$

where,

t = 1, 2, 3, 4, 5

a = mean warp tape width in mm and

N = Number of warp tapes/20 cm.

E.6.2 $(K\text{f}_1 = 1/5\ (K\text{f}_1 + K\text{f}_2 + K\text{f}_3 + K\text{f}_4 + K\text{f}_5)$

where,

$K\text{f}$ = Degree of weft coverage for the sample and

$K\text{f}_1, K\text{f}_2 \ldots K\text{f}_5$ = Degree of weft coverage for each marked space (area).

$K\text{ft} = 0.5nb$

where,

t = 1, 2, 3, 4, 5,

n = number of weft tapes/20 cm, and

b = mean tape width in mm.