
**Textile - Woven Shirting's made of cotton
man-made fibres/filaments and their blends -
specification**

ICS: 61.020

Published by Ethiopian Standards Agency
©ESA

Foreword

This Ethiopian Standard has been prepared under the direction of Technical Committee for Made-up-Textiles & Ready-Made Garments (TC 72) and published by the Ethiopian Standards Agency(ESA).

In preparing this standard reference has been made to IS 15852 *Textile - Woven Shirting's made of Cotton man-made fibres/filaments and their blends - specification*

Acknowledgement is made to the (IS) Indian standards for the use of the said publication in preparing The standard.

Textile - Woven Shirting's made of cotton man-made fibres/filaments and their blends - specification

1. Scope

This Ethiopian standard specifies the requirements for woven shirtings made of cotton, man-made fibres/filaments and their blends.

2. Normative reference

The following referenced documents are indispensable for the application 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.

ES ISO 1833-11, Textile- Quantitative chemical analysis part 11: Mixtures of cellulose and polyester fibres (method using sulfuric acid)

ES ISO 7211-1, Textiles – Woven fabrics – construction – Methods of analysis – Part 1: Methods for the presentation of a weave diagram and plans for drafting denting and lifting.

ES ISO 7211-2, Textiles-Woven fabrics-Constructions- Methods of analysis part 2: determination number of threads per unit length

ES ISO 3801, Textiles -Woven fabrics-Determination of mass per unit length and mass per unit area ES ISO 13934-1, Textiles -Tensile properties of fabrics - Part 1: Determination of maximum force and elongation at maximum force using the strip me.

ES ISO 13937-1, Textiles- Tear properties of fabrics- Part 1: Determination of tear force using ballistic pendulum method.

ES ISO 5077, Standard Test Method for Antimony Oxide in White Pigment Separated From Solvent-Reducible Paints¹

ES ISO 3071, Textiles — Determination of pH of aqueous extract

ES ISO 105-C10, Textiles — Tests for colour fastness — Part C10:Colour fastness to washing with soap or soap and soda

ES ISO 105-X12, Textiles — Tests for colour fastness — Part C12: Colour fastness to industrial laundering

ES ISO 105-E04, Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration

ES IS 11827 textiles - composition testing - identification of fibers

ES ISO 12945-2Textiles — determination of fabric propensity to surface fuzzing and to pilling — part 2: modified Martindale method

ES ISO 12947-3 Textiles — Determination of the Abrasion Resistance of Fabrics by the Martindale Method
—Part 3: Determination of Mass Loss

3. Terms and Definition

For the purpose of this document the definitions in ES 6265 and the following shall apply.

3.1.

Yarn

The yarn used in the manufacture of woven shirting's shall be satisfactory in evenness and reasonably free from spinning defects. The fibre composition of the yarn shall be declared by the manufacturer and it shall conform to the tolerances specified in Table I.

3.2.

Shirt

Garment for the upper body made of cotton or a similar fabric, with a collar and sleeves, and with buttons down the front.

4. Requirements

4.1. Yarn and cloth

- 4.1.1. The yarn used in the manufacture of the fabric shall be made from uniform and intimate blend of polyester Cotton or Viscose as per the requirement.
- 4.1.2. Two folds of evenly spun yarn reasonably free from neps and other spinning defects shall be used for both warp and weft.
- 4.1.3. The fabric shall be uniformly woven in plain weave and the selvages shall be firm and straight.
- 4.1.4. The fabric shall be well singed.
- 4.1.5. The fabric shall be 'Heat set' and fully shrunk.
- 4.1.6. Have been made in accordance with sustainable textile ES 6702.
- 4.1.7. Be of acceptable uniform make, width, colour, and finish,
- 4.1.8. Be delivered in a clean and commercially dry condition.
- 4.1.9. The cloth shall conform to the requirements specified in Table I.
- 4.1.10. Blend composition of the fabric shall conform to the requirements given in Table 1.
- 4.1.11. The cloth shall conform to the requirements specified in Table 1.
- 4.1.12. The allowance for providing extra length of cloth in lieu of flaws (defects) not exceeding the permissible limits may be as agreed to between the buyer and the seller

4.2. Constructional Particulars

The constructional particulars, namely, linear density of warp and weft yarns in tex, number of ends and picks per decimeter, mass in g/m' and the blend composition in case of woven shirting's made of blends/mixtures of fibres shall be as declared by the manufacturer and the finished shirting shall meet the

relevant tolerances specified in Table I.

Table 1:-Technical requirements for shirt fabrics

S.No	Characteristics	Requirement	Method of Test
1	Fibers/material composition in %		ES ISO 1833-11
	Polyester	65±5	
	Cotton/Viscose	35±5	
2	Fabric structure	Plain1*1/ twill weave	ES ISO 7211-1
3	Number of Threads/cm, min		ES ISO 7211-1
	Warp	23	
	Weft	18	
4	Yarn count in Ne		ES ISO 7211-5
	Warp	35±5	
	Weft	35±5	
5	Grammage (GSM), g/m ²	110 - 145	ES ISO 3801
6	Tensile strength @ break in N, min		ES ISO 13934-1
	Warp way	600	
	Weft way	55	
7	Tear strength, N (kgf) , Min: a) Warp way b) Weft way	10 9	ES ISO 13937-1
8	Dimensional stability (After3 washes) in Max. in %		ES ISO 6330
	Warp way	±3	
	Weft way	±3	
9	Wrinkle recovery per min	4 - 5	ES ISO 9867
10	pH Value of fabric	6.0-8.0	ES ISO3071
11	Color fastness to Perspiration (acidic and alkaline) min		ES ISO 105-X12
	Change in color	4	
	Staining of adjacent fabric	4	
12	Color fastness to Rubbing ,min		ES ISO 12945-2
	Dry	4	
	Wet	3-4	

13	Pilling resistance /5000rubs/ Min	3-4	ES ISO 12947-3
14	Abrasion resistance		ES ISO 12947-3
	In mass loss in % max	5/4	
15	Whiteness index in %Min (for full white fabrics)	60	ES ISO 105-J01
16	fabric drapability in % coefficient	<40	ES ISO 9073-9
17	Minimum colour fastness ratings to: a) Light (change in colour) b) Washing: Test 2: 1) Change in colour 2) Staining of adjacent fabrics c) Dry-heat (change in colour) d) Perspiration (acidic and alkaline): 1) Change in colour 2) Staining of adjacent fabric e) Rubbing: 1) Dry 2) Wet f) Hot pressing: 1) Change in colour 2) Staining of adjacent fabrics	5 4 3-4 4 4 4 4 3 4 4	ES ISO 105-C10 ES ISO 105-B02 ES ISO 105-X16 ES ISO 105-X11
18	Crease recovery angle. degrees, Min : a) Dry b) Wet	240" 240"	ES ISO 2313
19	Soil release efficiency, percent , Min	80	
20	Limited flame spread index , Min	2	ES ISO 9239-2
21	Seaming slippage/properties a) Woven textile fabrics weight ≤ 220 g/ m ² – load applied 60 N b) Woven textile fabrics weight > 220 g/ m ² – load applied 120 N	Seam opening ≤ 6 mm Seam opening ≤ 6 mm	ISO 13936-2 Seam according to ready-made product
22	Seam strength (N) a). Woven textile fabrics weight ≤ 220 g/ m ² – load applied 60 N		

	b). Woven textile fabrics weight > 220 g/ m2 – load applied 120 N c). lining – load applied 80 N	Seam opening ≤ 6 mm	ISO 13935-1&2
--	--	---------------------	---------------

5. Labeling and packaging

5.1. The shirt shall be marked with the following information:

- a) Fabric Composition
- b) Size
- c) Name of manufacture or country of origin
- d) Instructions for care and cleaning

5.2. The Packing shall be marked with the following information:

5.2.1. Unless otherwise required, each piece shall be rolled, full-width and face inward, on an acceptable tube. Only pieces of the same type, width, design (when relevant), color(s) and finish shall be packed together in a bulk container and shall be comply.

5.3. Unit Packages

5.3.1. The following information shall be indelibly and legibly marked on unit packages:

- a) Manufacturers name, address, registered trade mark and country of origin;
- b) Destination;
- c) Name and Description of the product
- d) Batch number
- e) Serial number and/or barcode of the consignment
- f) Date of dispatch
- g) Care instructions

5.3.2. Bulk Packages

5.3.2.1. The following information shall be indelibly and legibly marked on unit packages:

- a) Manufacturer's name, address and registered trade mark;
- b) Name and Description of textile product;
- c) Number of cartons in a wrapped form for air shipment;
- d) Number of unit packages in the bulk package;
- e) Gross Mass;
- f) Batch number;
- g) The inscription: Made in Ethiopia or name of 'Country of manufacture' for imports

6. Sampling

6.1. Lot

The number of woven shirting pieces of the same type and composition and constructional particulars delivered to a buyer against one dispatch note shall constitute a lot.

6.2. The number of woven shirting pieces to be selected at random shall be according to col 2 and 3 of Table 2. To ensure the randomness of selection, IS 4905 may be followed.

6.3. Number of Tests and Criteria for Conformity

6.3.1. The number of pieces to be selected for major flaws shall be in accordance with col 3 of Table 2.

For constructional details, such as count of yarn, threads per decimeter, mass in g/m", length, width and manufacture, the number of pieces selected shall be in accordance with col 5 of Table 2.

For all other tests, the number of pieces selected shall be as given in col 6 of Table 2.

6.3.2. All the pieces selected from the lot shall be visually examined for major flaws and tested for all other requirements as specified in 3. 1, 3.2 and Table I. A piece shall be declared defective if it contains one or more major flaws or it does not meet any of the requirements specified in Table I.

The lot shall be declared conforming to the requirements of this standard if the total number of defective pieces does not exceed the value given in col 4 of Table 2.

Table 2 Sample Size

SI No (1)	Lot Size (2)	Sample Size (3)	Permissible Number or Non-conforming Pieces (4)	Sub-sample Size (5)	Sub-sub-sample Size (6)
i)	Up to 50	5	0	3	2
ii)	51 to 100	8	0	5	3
iii)	101 to 300	13	1	5	3
iv)	301 to 500	20	1	8	5
v)	501 to 1 000	48	3	10	7
vi)	1001 and above	50	3	10	7

ANNEX A

(Normative)

Garment defects

Critical Defect - A defect that is likely to result in a hazardous or unsafe condition for an individual or anyone around him using the product or that contravenes mandatory regulations.

Tolerance limits for defects (size, repeatability, quality, significance) will be defined later. The appearance of a critical defect stops the production.

Major Defect – A defect that is likely to result in failure; reducing the usability of the product and obvious appearance defects affecting the sale ability or shorten the life cycle of the product.

Tolerance limits of defects (size, repeatability, quality, significance) will be defined later.

4 Major defects -> 1 critical defect -> stop the production.

Minor Defect –A defect that does not reduce the usability of the product but is nevertheless a workmanship defect beyond the defined specifications or construction requirements.

Tolerance limits for defect (size, repeatability, quality, significance) will be defined later.

4 Minor defects -> 1 Major Defect.

Appearance Zones of the garment - The defects listed below are defects rated by two areas of the garment, Zone A and Zone B.

ZONE A = areas of the garment that will draw attention: front, center of back, upper side of sleeve, upper side of collar.

ZONE B = areas of the garment that will not draw attention: sides under arm/sleeve, under sleeve, under collar, inner legs, inner collar and lining. To be defined more in detail later.

APPEARANCE ZONE A

Defect Description Style	Critical	Major	Minor
-----------------------------	----------	-------	-------

Styles not matching Approval sample, Tech Pack or order	X		
---	---	--	--

Material Defects - Woven Garments

Weaving Faults - (broken yarn)	X		
Weaving Faults – (missed yarn)	X		
Weaving Faults – (rough yarn)	X		X
Weaving Faults – (pills)	X		
Weaving Faults – (color stripes)	X		

Weaving Faults – (thick place)	X
Weaving Faults – (thin place)	X
Weaving Faults – (thick bar)	X
Weaving Faults – (thin bar)	X
Holes (any size of hole)	X
Fabric torn	X
Permanent crease lines in fabric	X
Permanent fold lines in fabric	X

Material Defects - Knit Garments

Knitting Faults – (broken yarn)		X
Knitting Faults – (uneven knitting yarn)		X
Knitting Faults – (rough yarn)	X	
Knitting Faults – (slub)		X
Knitting Faults – (pills)		X
Knitting Faults – (dye bars)		X
Knitting Faults – (stripes)		X
Knitting Faults – (run stitches)		X
Knitting Faults – (needle line)		X
Knitting Faults – (laddering)		X
Knitting Faults – (drop stitches)		X
Knitting Faults – (loose stitches)		X
Holes (any size of holes)		X
Fabric torn		X
Permanent crease lines in fabric		X
Permanent fold lines in fabric		X

Cleanliness

Stain	X	X
Oil spots	X	X
Oil stain	X	X
Water spots	X	X
Water stain	X	X
Rust stain	X	X
Pen mark	X	X
Pencil mark	X	X
Chalk mark	X	X
Glue stain	X	X
Glue mark	X	X
Untrimmed thread ends		X
Loose thread		X
Dust fibers attached on fabric surface		X
Loose fibers attached on fabric surface		X

Appearance

Color shade variation	X	X
Color off tone	X	
Glaze	X	
Poor ironing	X	
Crease mark	X	
Wrinkle mark	X	
Fold mark	X	X
Unmatched checks	X	X

Unmatched stripes	X	X
Sewn in wrong fabric direction	X	
Sewn in wrong fabric side	X	
Washing mark	X	X
Uneven washing effect	X	
Burned, scorched	X	
Over pressed (seam impressions)	X	
Stretched shape due to pressing	X	
Distorted shape due to pressing	X	
Bubbles due to improper fusing	X	

Stitching Defects

Broken stitches	X	
Skipped stitches	X	X
Run-off stitching	X	X
Uneven stitching	X	X
Irregular stitching	X	X
Wavy stitching	X	X
Insecure back stitching	X	
Loose stitch tension	X	X
Uneven stitch tension	X	X
Uneven stitch density	X	X
Missed stitching	X	
Missed bar tack	X	
Unmatched join stitching	X	X
Needle chewing (cutting and holes)	X	
Drill holes or markings exposed	X	

Seaming Defects

Open seam, missing stitch	X	
Seam slippage	X	
Puckered seam	X	X
Pleated seam	X	
Folded seam	X	
Twisted seam	X	
Seams folded opposite to specified direction	X	
Unaligned seam	X	
Unmatched seam	X	
Seam not fully opened before top stitching	X	
Insufficient seam allowances	X	
Uneven pleats length	X	X
Uneven darts width	X	X
Misplaced or missed bar tacks	X	
Uneven seam length	X	X
Twisting in turn ups	X	X

Collar/Neck

Uneven collar points	X	
Misshaped collar points	X	
Unbalanced collar	X	
Overlapping collar	X	
Bubble in collar fall	X	

Bubble in collar stand	X	
Uneven collar end	X	
Collar shape not as approved	X	
Seam allowances of the body are visible next to collar seam	X	

Placket, Fly, Buttoning

Uneven placket width	X	X
Incorrect placket width	X	
Uneven placket length	X	X
Visible under placket	X	X
Twisted, slanted, curved or pleated placket	X	X
Zipper sewn curved or with wrong ease	X	X
Buttoning (press buttons or Velcro closure) not aligned	X	X
Press buttons attached without support fabric or double layer	X	

Button & Button Hole

Missed button, swing neck button or button hole	X	
Broken button or swing neck button	X	
Insecure button stitching	X	
Wrong button	X	
Incomplete stitching	X	
Uncut or partly cut button hole	X	
Unaligned button and button hole	X	X
Misplaced button and button hole	X	X
Button stitch not properly locked	X	

Sleeve & Cuff

Uneven sleeve length	X	X
Uneven sleeve placket length	X	X
Uneven sleeve placket width	X	X
Notches exposed at sleeve slit	X	
Wrong attachment of sleeve lining	X	
Uneven cuff width	X	X
Uneven cuff height	X	X

Front/Back Yoke/Shoulder

Excess gathering at yoke seam	X	X
Unmatched seams at armhole	X	X
Improper gathering at sleeve cap	X	X

Pocket & Pocket Flap

Wrong pocket, closure, top stitching or seam allowances	X	
Unaligned front pockets (hi-low pocket)	X	X
Slanted pocket	X	X
Excess tightness or fullness of pocket	X	X
Pocket cloth not smooth when bar tacking	X	X
Twisted pocket cloth	X	
Poorly shaped pocket	X	
Poorly shaped pocket corner	X	
Misplaced pocket position	X	X
Incorrect pocket position	X	
Exposing pocket corner	X	
Incorrect position of pocket flap	X	

Hem

Uneven hem	X	X
------------	---	---

Twisted hem	X	
Wavy hem	X	X
Torn at ribbing	X	
Holes at ribbing	X	
Little recovery or no elasticity at ribbing	X	

Lining

Lining too short or too long	X	
Puckering at lining seam	X	X
Twisted lining	X	

Waistband & Belt Loops, Hanger band

Uneven waistband (Hi-low waistband)	X	X
Poor waistband finishing	X	X
Waistband stitching broken when stretched	X	
Little recovery or no elasticity at waistband	X	
Missing button or bar tack in adjustable waistband	X	
Missing belt loop	X	
Uneven belt loop	X	X
Wrong or improper position of belt loop	X	
Missing hanger band inside waist	X	

Fly

Uneven fly width	X
Curved fly edge	X
Zipper exposed when fly is closed	X
Construction instructions or pattern not followed markings	X

Leg

Twisted leg	X	
Uneven leg	X	
Side seam turned wrongly	X	
Irregular hem width	X	X

Labels, Customized labels & Embroideries

Missing CE-Label(CEGarments)	X	
Missing pictograms(CEGarments)	X	
Missing care label(CEGarments)	X	
Missing user instruction booklet(CEGarments)	X	
Missing size label(CEGarments)	X	
Wrong or missing Purchase Order/manufacturing date label	X	
Missing Lindström seam label or hanger loop		X
Missing customized logo label or embroidery		X
Missing marking label		X
Wrong label, hanger loop or embroidery		X
Missing size and product number label		X
Wrong marking label		X

Visual label quality:

Label insecurely stitched (embroidered label)	X	X
Label folded by stitching (embroidered label)	X	X
Wrong back ground material (embroidered label)	X	
Wrong fusible material (embroidered label)	X	
Slippage in label (over lock is mismatching)	X	
Incorrect embroidery stitch density (embroidery or embroidered logo label)	X	
Label not according to specification (wrong color, size or design)	X	

Label position is not according to Tech Pack	X
Attaching seam labels and hanger loops: label is attached poorly	X
Attaching customized logo label:	
Stitch distance too near the edge (fraying)	X
Label sewn inverted (label up-side-down) or reversed (label up-side-down)	X
Wrong size label	X

Printing Defects in Customized logos or print images

Missing printing	X
Misplaced printing	X
Printing faults – (printing stain or cracking print result)	X X
Printing faults – (off printing, white print color translucent)	X
Color off shade or not as specified	X
Wrong printing	X

Transponder

Missing transponder	X
Transponder placed wrong	X

Labels and Hangtags – 3rd party and non rental garments

Missing label or hangtag	X
Wrong label or hangtag	X
Care label – no label	X
Care label – label inaccessible and no details elsewhere	X
Care label – letter height under 1.5mm	X
Care label – only symbols used	X
Care label – not legible	X
Care label – does not comply with legal specification	X
Country of Origin – no label	X
Country of Origin – label inaccessible and no details elsewhere	X
Country of Origin – letter height under 1.5mm	X
Country of Origin – does not comply with legal specification	X
Fibre Composition– no label	X
Fibre Composition – label inaccessible and no details elsewhere	X
Fibre Composition– letter height under 1.5mm	X
Fibre Composition – does not comply with legal specification	X

Accessories

Wrong accessories	X X
Damaged accessories	X
Scratches	X
Poor plating	X
Sharp points	X
Sharp edges	X
Rust	X
Color discharged	X
Malfunction of zipper	X
Zipper slider not running smoothly	X X
Missing zipper teeth	X
Missing zipper puller	X
Wavy zipper	X X

Poor setting of zipper	X	
Zipper tape too close to fly seam affecting zipper function	X	
Detached ring, socket, stud or post	X	
Press button too tight or loose to close or open	X	X
Detached swing neck button or rivet	X	
Fabric torn around press buttons or swing neck buttons	X	
Press buttons sewn upon zipper tape	X	
Missing Velcro tapes	X	
Misplaced Velcro tapes	X	X
Reflective bands sewn too close or far away from the edge	X	
Missing shoulder pads	X	X
Misplaced shoulder pads	X	X

Body

Excess gathering at any seam	X	X
Unmatched seams at armhole	X	X
Improper gatherings at sleeve cap	X	X
Deformed shape	X	
Twisted sleeve	X	
Twisted body	X	

Measurement Miscellaneous Defects

Outside tolerance (tolerance is +/- half of next size)	X
Odor	X
Mildew	X
Wet item	X
Damp item	X
Visible or disturbing mending places	X
Unwanted objects in garment, like needle or piece of metal	X

Please note the above list is not all inclusive and is to be used as a guide only.

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010. ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1998.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

ESA has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of ESA.

International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

More Information?

Contact us at the following address.

The Head Office of ESA is at Addis Ababa.

☎ 011- 646 06 85, 011- 646 05 65

☎ 011-646 08 80

✉ 2310 Addis Ababa, Ethiopia

E-mail: info@ethiostandards.org,

Website: www.ethiostandards.org



Standard Mark