CES 37

Compulsory Ethiopian Standard

Third Edition
2021

Sewing threads – General requirements

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Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Sewing and Embroidery Threads(TC 69) and published by the Ethiopian Standards Agency (ESA).

This Compulsory Ethiopian Standard cancels and replaces CES 37:2013

Application of this standard is COMPULSORY with respect to clauses 6 and 8.
A Compulsory Ethiopian Standard shall have the same meaning, interpretation and application of a "Technical Regulation" as implied in the WTO-TBT Agreement.
Implementation of this standard shall be effective as of 01 October 2020.

Sewing threads – General requirements

1 Scope

1.1 This Ethiopian Standard specifies consturctional detailes and other particulars of cotton sewing threads unbleached, bleached or dyed.

1.2 This standard does not specify the type of finish and feel of the sewing thread, nor does it specify the degree of whiteness of the bleached thread on the colour of the dyed thread.

2 Normative references

The following referenced documents are indispensable for the application of this Ethiopian standard.

Only the latest edition of the documents (including any amendments) shall be applicable.

ES 127, *yarn – Determination of breaking load and elongation by the single strand method.*

ES 133 , *Yarns – Determination of twist by the untwist – retwist.*

ES 134, *Yarns – Determination of twist by direct counting method .*

ES 145, *Sewing threads – Code for packing.*

ES 146, *Textiles – Universal system for designation linear density (tex system).*

ES ISO 105-B01 *Method for determination of colour fastness of textile materials of daylight.*

ES ISO 105-C10 *Method for determination of colour fastness of textile materials to washing 90oC for 30 minutes.*

ES ISO 105-B07 *Method for determination of colour fastness of textile materials to perspiration.*

ES 2739 *Method for determination of viscosity (or fluidity) of solutions of cotton and regenerated cellulose in cuprammonium hydroxide.*

3 Definition

For the purpose of this standard the following definition shall apply

3.1
sewing thread
a variety of yarn, normally plied characterized by a combination twisting and finishing to secure a smooth, compact strand which is quite flexible but presents no loose fibres.

4 Types

This standard deals with threads made from natural cotton fibres.

5 Quality

5.1 General

5.1.1 Yarn

Raw yarn for manufacturing cotton sewing thread shall be of such quality that unevenness of yarn unevenness of counts of yarn and twist irrigularity are not noticeable.

5.1.2 Threads

a) The threads shall be twisted evenly and shall be of uniform thickness throughout. The first quality Cotton sewing thread should be reasonable free from knots and spinning and doubling defect depending on the end use. The number of knots and other defects in the second quality cotton sewing thread shall not exceed.

   a) 2 per 10,000 metres in unmercerized thread.

   b) 1 per 10,000 metres in mercerized thread.

b) White sewing thread shall have a uniform bleached finish. The dyed sewing threads shall be evenly dyed to the required shade and free from all dying defects.

c) The threads shall be finished soft mercerized or glazed as required and free from all finishing defects.

d) The threads shall work satisfactorily on all the appropriate types of hand and power driven sewing machines.

6 Special requirements

6.1 The sewing threads shall comply with the requirements specified in Table 1.

Variety No.	Nominal** universal count in tex (or normal cotton count)	Construction of thread	Length (m/kg) *	Single thread breaking load *** on 50cm test length (kg)
(1)	(2)	(3)	(4)	(5)
1	50 tex x 2 (or 12s/2)	2 ply (2 strands each single)	9530	1.68
2	21 tex x 2 (or 28s/w)	2 ply (2 strands each single)	22020	0.70
3	20 tex x 2(or 30s/2)	2 ply (2 strands each single)	74560	0.65
4	16 tex x 2 (or 36s/2)	2 ply (2 strands each single)	29640	0.68
5	15.5 tex x 2 (or 6s/3)	2 ply (2 strands each single)	31340	0.68
6	15 tex x 2 (or 40s/2)	2 ply (2 strands each single)	33030	0.65
7	98 tex x 3 (or 6s/3)	3 ply (3 strands each single)	3100	7.00
8	60 tex x 3 (or 10s/3)	3 ply (3 strands each single)	5220	4.10
9	50 tex x 3 (or 12s/3)	3 ply (3 strands each single)	6340	2.75
10	37 tex x 3 (or 16s/3)	3 ply (3 strands each single)	8200	2.05
11	25 tex x 3 (or 24s/3)	3 ply (3 strands each single)	12900	1.60
12	18.5 tex x 3 (or 32s/3)	3 ply (3 strands each single)	16940	1.40
13	15 tex x 3 (or 40s/3)	3 ply (3 strands each single)	21510	1.00
14	12 tex x 3 (or 50s/3)	3 ply (3 strands each single)	27100	0.78
15	12 tex x 3 (or 50s/3) mercerized	3 ply (3 strands each single)	27100	0.90
16	9.8 tex x 3 (or 60s/3)	3 ply (3 strands each single)	32690	0.60
17	7.4 tex x 3 (or 80s/3)	3 ply (3 strands each single)	43520	0.52
18	6 tex x 3 (or 100s/3)	3 ply (3 strands each single)	53680	0.41
		4 ply	2330	10.00

* The minimum breaking load values and minimum lengths in metres per kilogram as specified in table 1 shall apply to sewing threads irrespective of the type of finish.

** Universal count in tex – the number of grams per kilometre.

*** Determination of breaking load and elongation of yarns by the single strand method.

Variety No.	Nominal** universal count in tex (or normal cotton count)	Construction of thread	Length (m/kg)	Single thread breaking load *** on 50cm test length (kg)
(1)	(2)	(3)	(4)	(5)
19	98 tex x 4 (for 6s/4)	(4 strands each single)		
20	25 tex x 4 (or 24s/4)	4 cord (2 strands each 2 fold)	9310	2.10
21	18.5 tex x 4 (or 32s/4)	4 cord (2 strands each 2 fold)	11750	1.75
22	15 tex x 4 (or 40s/4)	4 cord (2 strands each 2 fold)	15120	1.30
23	12 tex 4 (or 50s/4)	4 cord (4 strands each fold)	19050	1.00
24	9.8 tex 4 (or 60s/4)	4 cord (4 strands each single)	24200	0.90
25	7.4 tex x 4 (or 80s/4)	4 ply (4 strands each single)	32180	0.70
26	98 tex x 5 (or 6s/5)	5 ply (5 strands each single)	1780	11.50
27	18.5 tex x 6 (or 32s/6)	6 cord (3 strands each fold)	7910	2.60
28	16 tex x 6 (or 36s/6)	6 cord (3 strands each 2 fold))	9070	2.25
29	15 tex x 6 (or 46s/6)	6 cord (3 strands each 2 fold))	10720	2.15
30	12 tex x 6 (or 60s/6)	6 cord (3 strands each 2 fold))	13550	1.70
31	9.8 tax 6 (or 60s/6)	6 cord (3 strands each 2 fold))	15120	1.35
32	7.4 tex 6 (or 80s/6)	6 cord (3 strands each 2 fold))	21170	1.10
33	6 tex (or 100s/6)	6 cord (3 strands each 2 fold))	26250	0.90
34	98 tex x 8 (or 6s/8)	8 ply (8 strands each single)	1100	16.80
35	27 tex x 9 (or 22s/9)	9 cord (3 strands each 3 fold)	3600	5.50
36	25 tex x 9 (or 24s/9)	9 cord (3 strands each 3 fold)	4050	5.00
37	18.5 tex x 9 (or 32s/9)	9 cord (3 strands each 3 fold)	5250	4.10
38	15 tex x 9 (or 40s/9)	9 cord (3 strands each 3 fold)	6550	3.20
39	12 tex x 9 (or 50s/9)	9 cord (3 strands each 3 fold)	8280	2.64
40	98 tex x 10 (or 62/10)	10 ply (10 strands each single)	800	19.50
41	30 tex x 27 (or 20s/27)	27 cord (3 strands each 9 fold)	1130	17.25
42	16 ex x 27 (or 36s/27)	27 cord (3 strands each 9 fold)	2020	10.00
43	25 tex x 45 (or 24s/45)	45 cord (3 strands each 15 fold)	805	26.00
Method of test		-	-	ES 127

6.2 Length

6.2.1 The length of sewing thread in a tube, spool, real or cone shall be note less than the length marked on its label.

6.2.2 The length of sewing thread shall be determined using a wrap reel with a tensioning device as specified under A.3. of appendix A.

6.3 Breaking Load

6.3.1 The single thread breaking load of sewing thread of the varieties listed in Table 1 shall be note less than the prescribed value specified in the Table.

6.3.2 The single thread breaking load of sewing thread shall be determined by the method described in ES.127.

6.4 Balance of twist

A maximum of 5 turns as re-twist or double on account of the kink shall be permitted in the loop when the two ends of the thread gripped by hand at an approximate distance of 1.5 m are brought together.

6.5 Colourfastness

The dyed threads which are declared as “fact colour” shall conform to the requirements specified in Table 2.

Table 2 – Colour fastness requirements and methods of test

Serial No.	Agency	Colour fastness requirements	Methods of test
1	Daylight	5 or better	ES ISO 105-B01
2	Washing	4 or better	ES ISO 105-C10
3	Perspiration	5 or better	ES ISO 105-B07

6.6 Cuprammonium fluidity

6.6.1 The cuprammonium fludity of sewing thread shall not be more than 8 poise***

6.6.2 The cuprammonium fludity of sewing thread shall be determined by the method **** to be described in the future.

6.7 Direction of final twist

The direction twist in sewing thread, when tested acording to ES 133 or ES 134 shall be as required by the purchaser. In the absence of any special request the direction of the final twist be « Z »twist.

6.8 Testing

The physical and mechanical tests of threads and other textile strands shall be performed in the standard atmosphere as specified in ES 146.

7 Sampling

7.1 Lot

The quality of cotton sewing thread of the same variety delivered to a buyer against a despatch note shall constitute the lot.

7.2 The conformity of the lot to the requirements of this standard shall be determined on the basis of tests carried out on the samples selected from the lot.

7.3 The number of packs to be selected at random froma lot shall be as specified in Table 3.

Table 3 – Number of packs to be selected at random froma lot

Number of packs in the lot	Number of packs to be selected
Up to 15	5
16 to 30	7
32 to 50	10
51 to 100	15
101 to 300	21
301 and above	30

7.4 One tube or real shall be selected at random from each of the packs selected as specified in Table 3. The tube or reel thus selected shall constitute the test sample for determining ;

a) length in m/kg;

b) breaking load;

c) balance of twist, and

d) length per tube or reel (subject to a minimum of 20 tubes or reels).

7.4.1 For testing colour fastness, and cuprammonium fluidity two test pieces of the required size for a lot size of 30 packs or less and 3 test pieces for a lot more than 30 packs shall be taken from the tube drawn in accordance with Table 3 and tested individually.

7.5 Criteria for conformity

The lot shall be declared as conforming to the requirements of this standard if the follwing conditions are satisfied :

a) [1,2,3,4] from the test results for lengths in m/kg or breaking load the average X and the range R or average shall be calculated and the value of the expression X – KR or X – KR is greater than or equal to the relevant value specified;

c) All the test pieces tested for balance of twist and colour fastness and cuprammonium fluidity should satisfy the relevant requirements; and

c) The average of the length measurements shall not be less than the marked length.

Note 1 : Average X is the value obtained by dividing the sum of the observed values by the number of tests.

Note 2 : Range R is the difference between the maximum and the minimum in a set of observed values.

Note 3 : When the number of test results is 10 or more, they shall be grouped in groups of five. The mean range R is the value obtained by taking the average of the ranges of the groups.

Note 4 : The value of the constant K is equal to 0.4.

8 Packing

8.1 The sewing thread shall be uniformly and compactly wound in the form of balls, tubes, reels, cones, skeins, spools, or in any other form as required. In all cases, the free end of the thread shall be securely fastened to prevent unrevelling.

8.2 The construction and finish of cones, reels, cops and tubes shall be such that they shall not imped the smooth and even unwinding of the thread on the machine.

8.3 Unless otherwise specified, sewing threads shall be packed according to the method described in ES 145.

Annex A

(Clause 6.2.2 and Table 1)

Measurement of length

A.1 Atmosphereic conditions for testing

A.1.1 The tests shall be carried out in a standard atmosphere at 65±2 percent relative humidity and 20±2°C (see ES 146).

A.2 Conditioning of test pieces

A.2.1 Prior to tests, the test pieces shall be conditioned in a standard atmosphere at 65±2 percent relative humidity and 20± 2°C, (see also ES 146).

A.3 Apparatus

The following apparatus shall be used :

- Wrap reel – having a perimeter of 1 metre ±0.4 percent. The actual perimeter of reel shall be determined by passing a strip of gummed paper tightly around the reel and securing it by adhesion at the overlap. The strip is then cut across its width, removed from the reel and its length measured to an accuracy of 0.1 percent. Determination shall be made at 3 places across the width of the reel.

- An adjustable yarn tensioning device – it shall be capable of giving a reeling tension that will result in skeins of the specified length when measured under a load of 0.5 gf/tax.

Weighing balance – it shall be capable of weighing skeins in grams, and with an error of not more than 0.2 percent.

A.4 Procedure

The package constituting the test pieces shall be placed on the wrap reel and 100m of thread shall be wound under a suitable reeling tension (see A.3). The thread so wound shall be removed from the wrap reel and weighed.

A.5 Calculation

A.5.2 Similarly the length in m/kg of other test pieces shall be determined.

$$Length\ in\ metres\ per\ kg = \frac{100\ x\ 1000}{W_1}$$

Where :

W_1 *is the mass in grams of 100 metres of thread.*

A.5.2 Similarly the length in m/kg of other test pieces shall be determined.

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Ethiopian Standards Agency

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,
- ❖ Facilitat 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.

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).

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