
**Textiles — Acrylic Yarn for Hosiery —
Specification**

ICS: 59.080.01

Published by Ethiopian Standards Agency
©ESA

Foreword

This Ethiopian Standard has been prepared under the direction of Technical Committee for Textile Yarns (TC 68) and published by the Ethiopian Standards Agency (ESA).

In preparing this Ethiopian Standard reference has been made to the IS 15336: 2013 *Textiles — Acrylic Yarn for Hosiery — Specification*; published by Bureau of Indian Standard (BIS).

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

Textiles — Acrylic Yarn for Hosiery — Specification

1. SCOPE

This Ethiopian standard prescribes the quality requirements for non-bulky and bulky acrylic yarn used in the manufacture of hosiery goods.

2. NORMATIVE REFERENCES

ES 6289 Standard Terminology for yarn spinning systems

ES 926 Method for identification of textile fibers

ES 6700 Code for inland packaging of manmade or cotton fiber yarn and fabrics

3. Terminology

For the purpose of this standard the definition in ES 6289 and the following definitions shall apply

3.1.

acrylic Shrinkable Fiber

When acrylic fiber is stretched under heat and cooled whilst under tension, it attains lateral shrinkage of the order of 16 to 22 percent. Such fibres are known as acrylic shrinkable fibers.

When these (shrinkable) fibers are subjected to heat accompanying water under specific condition, in free State show effective contraction.

Conventional bulky acrylic yarn is made by mix spinning of fiber having low shrinkage or no shrinkage and fiber having high shrinkage in definite proportion.

Such spun yarn, if heat treated by water or by steam, becomes bulky because fiber of no shrinkage bulges outward, with fiber of high shrinkage as core.

3.2.

bulky Yarn

Spun yams made from staple fibres having a high degree of resilience in which the apparent density is much lower than the real density.

4. REQUIREMENTS

4.1. The acrylic yarn shall be spun from acrylic staple fibres as bulky or non-bulky yarn. The identification of the fiber shall be done as per the tests prescribed in ES 926. The yarn may be grey or dyed.

4.2. The acrylic yarn shall meet the requirements given in Table 1 below

Table 1 Requirements of Acrylic Yarn for Hosiery

SN	Characteristics	Requirements				Test Method
		Non Bulky		Bulky		
		Grey	Dyed	Grey	Dyed	
1	Count CV%	4	4	5	5	ES 136
2	Single yarn tenacity, gf/m	20	17	13	10	ES 127
3	CV% of single yam tenacity	15	15	15	15	ES 127
4	U%	14	14	13	13	ES 136
5	Thin place, per km(-50%)	90	95	60	75	ES 136
6	Thick place, per km(+50%)	155	180	125	155	ES 136
7	Neps, per km(+200%)	160	195	135	155	ES 136
8	Imperfections, per km	395	470	-	-	ES 136
9	Shrinkage, percent	2.5 ± 1	2.5 ± 1	22 ± 1	1.5 ± 1	Annex A
10	Color fastness:					
	Light		5 or better		5 or better	ES-ISO 105-B07
	Washing		4 or better		4 or better	ES-ISO 105-C10

NOTES:

1. The lot shall be considered as conforming to the requirements of this standard, if the following conditions are satisfied:
 - a) Coefficient of variation for the count is less than the specified values;
 - b) Tenacity, is greater than or equal to the minimum specified values, and the coefficient of variation is less than the specified values; and
 - c) All the test specimens examined for, evenness, shrinkage in boiling water, and color fastness shall satisfy the relevant requirements.
2. The unevenness values are only for single ply yarn and it can be expressed as coefficient of variation of unevenness using the formula $CV \% = 1.25 \times U\%$.
3. The speed and sensitivity levels of user may be as given below, subject to agreement between the buyer and the seller:
 - a) Speed : 400m/min
 - b) Thick : + 50 percent
 - c) Thin : – 50 percent
 - d) Nep : + 200 percent
4. Tenacity values are the minimum required and other values specified are the maximum.
5. Bulky yarns may consist of minimum 30 percent shrinkable fibers.

5, MARKING

4.3. Each cone of yarn shall be marked with the following:

- a) Count of yarn followed by the word 'Acrylic yarns for hosiery';
- b) Type of yarn, that is, non-bulky yarns or bulky yarns;
- c) Net mass of yarn in package;
- d) Indication of the source of manufacture;
- e) Batch No. or month and year of manufacture; and
- f) Any other information required by the buyer or by the law in force.

4.4. Each bale or case containing cones shall be marked with the following:

- a) Count of yarn followed by the word 'Acrylic yarns for hosiery';
- b) Net mass of yarn in bulk packing;
- c) Gross mass of yarn in bulk packing;
- d) Indication of the source of the manufacture;
- e) Batch No. or month and year of manufacture; and
- f) Any other information required by the buyer or by the law in force.

6.PACKING

Unless otherwise agreed with the customer, the yarn shall be packed in accordance with the procedure laid down in ES 6700

7. SAMPLING

4.5. Lot

In any consignment the bales or cases containing yarn of the same type and of the same nominal count shall constitute a lot.

4.6. Samples shall be drawn from each lot to determine its conformity with the requirements of the standard.

- 4.7. Unless otherwise agreed to between the buyer and the seller the number of cases or bales to be selected from a lot shall be in accordance with Table 2. The bales or cases shall be selected at random and in order to ensure the randomness of selection.

Table 2 Sampling

Sl No.	Lot size	Sample size
1	up to 3	1
2	4 to 10	2
3	11 to 30	3
4	31 to 50	5
5	Above 50	8

- 4.8. In case two or less bales or cases are selected in the sample, at least 10 cones shall be drawn at random from each of the selected bale or case. However, in case three or more bales or cases are selected in the sample at least five cones shall be drawn at random from each of the selected bale or case. The number of leas to be prepared from each cone shall not be greater than 6. As far as possible, equal number of leas shall be prepared from each of the selected cone. The number of leas so prepared from the lot shall be equal to 30. In case single yarn tenacity is determined, the number of tests shall not be less than 50.

ANNEX A

DETERMINATION OF SHRINKAGE OF ACRYLIC YARNS FOR
HOSIERY**1. PRINCIPLE**

This test method covers the determination of shrinkage of yarns in skein form when immersed in boiling water. All measurements are made when the yarn is at standard conditions.

2. APPARATUS

- a) Skein reel 1.37 m circumference,
- b) Lacing string,
- c) Meter ruler mounted vertically with 'O' mark at the top and hook to hold the yarn at 'O' mark,
- d) Woven mesh bags of nylon or polyester, and
- e) Vessel for boiling skeins.

3. PROCEDURE

Make all skein length measurements in the standard atmosphere for testing textiles maintained at a relative humidity of 65 ± 2 percent and of $27 \pm 2^\circ$ (use ES ISO 139).

- a) Reel 109.7 meter (120 yard). Yarn (80 revolutions).
- b) Lace loosely in three places.
- c) Hang the skein over the hook on the vertical meter ruler.
- d) Attach the proper weight (see Table 3), based on yarn count, to the lower end of the skein.
- e) After the skein has hung with attached weight for 30s, measure the length of the skein with weight attached. Record this value as 'original skein length' '**say A**'.
- f) Twist the skein once into a shape of eight (8) and fold over, twist and fold again to give a four coil loop about $2 \frac{1}{2}$ inch in diameter. Place the skein in a mesh bag.
- g) Boil at 100°C for 30 min in water containing 2 percent non-ionic detergent.
- h) Cool to 50°C by overflow rinsing with cold water.
- i) Centrifuge skeins lightly or squeeze out excess water by hand.
- j) Remove skeins from mesh bag and air dry, or use hot air at a temperature below 100°C .
- k) Then recondition each dried skein in the standard atmosphere for testing textiles
- l) Measure skein length using the same weight used to determine original length. Record as length after boil-off '**say B**'.
- m) Calculate boil-off shrinkage to nearest 0.1 percent as follows:

$$\text{Shrinkage, percent} = \frac{A-B}{A} * 100$$

Table 3 Count Range — Single Yarn

SL No.	Metric count	English count	Weight (kg)
1	up to 17	up to 10	1.600
2	17 to 34	10 to 20	1.130
3	34 to 51	20 to 30	0.680
4	51 to 68	30 to 40	0.510
5	68 to 102	40 to 60	0.340
6	102 to 136	60 to 80	0.230

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