ETHIOPIAN STANDARD

ES 6698:2021

First edition
xx-xx-2021

Standard Test Method for Neps in Cotton Fibers

ICS: 59.080.20

Published by Ethiopian Standards Agency

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 standard reference has been made to ASTM D5866 for Standard Test Method for Neps in Cotton Fibers.

Acknowledgement is made to the ASTM for the use of the said publication in preparing the standard.

Standard Test Method for Neps in Cotton Fibers

1. Scope

1.1. This Ethiopian stanaed test method covers the measurement of the quantity and size of neps in cotton using various instruments.

1.2. This test method is intended for testing ginned cotton and cotton taken from various fiber processing stages.

1.4. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and deteremine the applicability of regulatory limitations prior to use.

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 6265 Terminology Relating to Textiles
ES 148 Practice for Sampling Cotton Fibers for Testing
ES ISO 24697 Practice for Conducting an Inter laboratory Study to Determine the Precision of a test Method
ES 124 Terminology for Cotton Fibers

3. Terminology

For the purpose of thist standards the terms specfyed in ES 6265 and ES 124 shall apllay

4. Summary of Test Method

4.1. A pre-weighed mass of cotton fiber is prepared per instrument manufacturer specifications the instrument then quantifies the neps and measures the size (diameter) of each nep.

4.2. Test data shows the mean or average nep size and the total number of neps per unit mass.

5. Significance and Use

5.1. Entangled cotton fiber that form neps have two sources: those that occur naturally as the cotton fiber develops on the plant in to lint that is ready to be harvested and those that occur from mechanical action in harvesting, ginning, cleaning, carding or from a combination of mechanical action.

5.2. This test method does not identify whether the neps counted and measured are a result of seed variety, environmental influences type of harvesting, or a result of mechanical processing. However, this information can be obtained from studies where samples are taken from plants in the field before harvesting and ginning, before and after cleaning, and carding before spinning.

5.3. The measurement of nep size and quantity going in to, and coming out of, a fiber processing stage are commonly used to make adjustments in the processing machinery to reduce or eliminate the generation of mechanical neps. Neps that remain in spun yarns have a direct influence on neps in fabrics .For almost all types of yarn or fabric, neps are considered defects.

5.4. This test method provides a consistent and repeatable measurement of fiber nep count and size. Check cotton samples supplied by the manufacturer are used to verify consistent measurement levels and laboratory-to-laboratory precision.

5.5. This test method is considered satisfactory for acceptance testing when the levels of the laboratories are controlled by the use of the same reference standard cotton samples because the current estimates of between-laboratory precision are acceptable under these conditions. If there are differences of practical significance between reported test results for two laboratories or more, comparative tests should be performed to determine if there is a statistical bias between them using competent statistical assistance. At a minimum, ensure the test samples to be used are as homogeneous as possible, are drawn from the material from which the disparate test results were obtained, and are randomly assigned in equal numbers to each laboratory for testing. The test from the two laboratories should be compared using a statistical test for unpaired data, at a probability level chosen prior to the testing series. If a bias is found, either its cause must be found and corrected, or future test results for that material must be adjusted in consideration of the known bias.

6. Apparatus and Material

6.1. An instrument with a fiber individualizer for opening, cleaning, and individualizing the fibers and with an appropriate sensor for counting and sizing neps.

6.2. Check Cottons 3

7. Sampling

7.1. Lot Sample—for acceptance testing, take lot samples in the applicable material specification or, in the absence of such a document, as directed in Practice ES 148.

NOTE1—An adequate specification or other agreement between the buyer and seller requires taking in to account the variability between sampling units, between laboratory samples with in a sampling unit, and between test specimens with in a laboratory sample to provide a sampling plan with a meaning full producer's risk, acceptable quality level, and limiting quality level.

7.2. Laboratory Samples—for ginned cotton testing, take the recommended amount of cotton fiber as indicated by the manufacturer from each sampling unit in the lot sample or subsamples from the lot samples.

7.3. For processing evaluations, take laboratory samples from processing stages while opening and cleaning lines are operating at normal production flow rates or from carding machines while they are operating at specific processing speeds.

7.3.1. Laboratory samples from opening and cleaning processing stages will be in loose fiber form and will require special handling to prepare test specimens. Please refer to the manufacturer's specific instructions for the proper preparation and handling for testing.

7.3.2. Laboratory samples from carding process will be in sliver form ready for specimen preparation.The sliver laboratory should contain a complete cross section of the entire card or comberweb.

8. Preparation and Adjustment of Apparatus

8.1. Set up the instrument as directed by the manufacturer's instructions.

8.2. Allow the instrument to warm up for at least 5m in before performing any tests, giving time for the electronics and any air flow to stabilize.

8.3. If the instrument requires air flow, check the requirements according to the manufacturer's instructions.

8.4. From two check cotton samples, test ten specimens prepared according to 10.1 and 10.2 at least once a week. Record the test data and compare them to the values supplied by the manufacturer.

8.4.1. The average of the ten tests on each of the check cotton samples should be within ± 15% of the designated values; other wise, consultation with the manufacturer's representative is necessary.

9. Conditioning

9.1. Neither laboratory samples nor test specimens need to be conditioned before testing. Moisture and temperature levels have no effect on the nep measurement.

10. Specimens

10.1. Test Specimens—Take the manufacturer's suggested number of specimens at random from each laboratory sample for single specimen feed instruments and for models with an automatic specimen feeding accessory. The weight and length of each specimen should be measured carefully according to the manufacturer's instructions.

10.2. For instruments that require the specimen to be in sliver from, hand draft each specimen in to a sliver to within ± 10 mm of the length specifies by the instrument's manufacturer. The consistency of the sliver specimen should be uniform, having no gaps or large undrafted clumps of cotton fibers

11. Procedure

11.1. Test each specimen following the instrument's instruction manual.

11.1.1. For instruments that have a single-specimen feedings lot, slowly feed at test specimen under the rotating feed roll to allow the specimen to be pulled in to the feed roll belt without wadding. Allow the specimen to be pulled completely through the test zone. If the instrument has an automatic specimen feeding carousel feature, insert a specimen in to the appropriate cylinder.

11.1.2. For instruments that have an automatic specimen feeding carousel, prepare specimens from all laboratory samples up to the limit allowed for the carousel. Take care to keep specimens from the same sample in sequential order. To assist with inserting sliver specimens in to the carousel cylinders, a knitting needle may be used to push the specimen in to the lower section of the cylinder to ensure the specimen will be taken in to the testing zone.

11.2. For both of the single-feed and automatic specimen feed instruments; the instrument will automatically purge the system and clean the fiber individualizer when a test is completed.

11.3. The instrument will require the fiber individualizer to be manually cleaned after operating for a certain amount of time or number of tests. Refer to the manufacturer's instructions for suggested manual cleaning.

12. Calculation

12.1. All calculations are performed by test instrument's micro processor and software reporting programs.

13. Report

13.1. State that the specimens were tested for neps as directed in this test method and note the make and model of the instrument used to test the specimens. Describe the sampling method used, lot sample, and sample identification.

13.2. Report the following information for each laboratory sample:

TABLE 1 Summary of Precision Parameters

Material	Average Nep count	Repeatability standard deviation (with a laboratory)	Reproducibility standard deviation (between a laboratories)	95% Repeatability limit (within a laboratory	95% Reproducibility limit (between a laboratories)
C	6	3.1	3.1	8.6	9.6
B	86	15.1	16.5	42.1	46.1
F	109	15.0	18.8	42.1	52.7
G	138	31.6	37.3	88.6	104.4
H	348	32.4	37.2	87.8	104.2
D	516	44.3	44.3	124.0	124.0
A	650	50.6	63.5	141.8	177.9
E	824	49.7	58.2	139.2	163.1

13.2.1. Nep count,

13.2.2. Average nep size (diameter in mm).

13.2.3. Summary histogram of nep sizes (if given by the instrument).

14. Precision and Bias

14.1. Precision—the averages of observed values should be considered significantly different at the 95% probability level if the differences equal or exceed the precision parameter listed in Table1.

14.1.1. The statistical report was prepared using software for Practice ES ISO 24697.

14.2. Bias—since there is no accepted reference material for determining bias in this test method for measuring neps, no statement on bias is being made.

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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).

<u>More Information</u>?
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