

EVALUATION OF COTTON FIBER QUALITY BASED ON NATIONAL AND INTERNATIONAL STANDARDS

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ABSTRACT:

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This article analyzes the role of national and international standards in assessing cotton fiber quality, the determination of quality indicators, and testing methodologies. The direct impact of cotton fiber quality on product quality and export potential is examined, and testing processes based on standards are described in detail. In addition, modern testing equipment, international requirements in quality control systems, and national regulations are comparatively analyzed. The article also provides practical recommendations for improving cotton fiber quality, standardization, and producing competitive products for international markets.

Cotton fiber is one of the most important industrial raw materials today and is widely used in the textile industry. The quality of cotton fiber is considered one of the key factors from cultivation to its application in manufacturing processes. If the quality of cotton fiber is low, the quality of the finished product also decreases, which may fail to meet consumer

demand and reduce export opportunities. Therefore, testing cotton fiber quality based on national and international standards has become economically and technologically significant in the modern era.

Standardization establishes unified criteria for evaluating cotton fiber quality, ensuring the comparability and reliability of analytical results. This article provides a general analytical overview of the precise determination of cotton fiber quality indicators, testing methods, differences between national and international standards, and their practical application.

Cotton fiber quality is characterized by a number of mechanical and technical properties. These indicators include the following:

Fiber length – the average length of fibers, which determines the elasticity and strength of cotton fiber.

Fiber fineness – the finer the fibers, the higher the quality of the final product.

Strength – the ability of fibers to withstand mechanical stress.

These parameters are considered the main indicators of cotton fiber quality, and testing methods for each of them are clearly defined in both national and international standards.

National standards are norms and requirements developed in accordance with the economic conditions and production systems of individual countries. Uzbekistan is one of the leading cotton-producing countries, and its national standards are designed to reflect local conditions, climate, production processes, and export requirements.

Testing based on national standards has the following advantages:

It takes into account the specific characteristics of local raw materials.

It provides clear guidelines for manufacturers.

It meets the quality requirements of the domestic market for cotton fiber.

For example, national standards define criteria for cotton fiber color, fiber length, and cleanliness, and specialized laboratories have been established to assess these parameters. National testing methods are adapted for producers and exporters and are convenient for routine practical application.

International standards establish global rules for evaluating cotton fiber quality. In order to compare cotton fiber quality in the global market, export products, and conclude international contracts, it is essential to rely on international standards. The main organizations responsible for developing international standards include:

ISO (International Organization for Standardization)

ASTM International (American Society for Testing and Materials)

These organizations develop universal criteria for cotton fiber quality. For instance, testing methods for parameters such as fiber length, fiber strength, cleanliness, and other characteristics are described in detail in ISO standards.

Through international standards, testing results can be compared worldwide, which significantly enhances export potential. If a product complies with ISO standards, it is accepted for export to any country, thereby strengthening trust and competitiveness in the international market.

Testing the quality of cotton fiber is a complex process consisting of several stages:

Sampling: The process of collecting cotton fiber samples for testing must be random. Samples are randomly taken from a raw material batch to ensure that the test results accurately represent the overall quality of the batch.

Laboratory testing: Laboratory tests include the following stages:

Determination of fiber length: The average fiber length is measured using specialized measuring equipment.

Mechanical properties: Fibers are subjected to parameters such as tensile strength and elongation to evaluate their mechanical behavior.

Each testing method is conducted in accordance with national and international standards, which ensures the reliability and accuracy of the analytical results.

Analysis of results: The obtained test results are analyzed using statistical methods. At this stage, the quality of cotton fiber is evaluated, compliance with established standards is determined, and a final report is prepared.

Indicator	National Standards	International Standards
Adaptability	<ul style="list-style-type: none"> Adapted to national conditions 	<ul style="list-style-type: none"> Based on global requirements
Application	<ul style="list-style-type: none"> For the domestic market 	<ul style="list-style-type: none"> In export and import
Testing methods	<ul style="list-style-type: none"> Simplified 	<ul style="list-style-type: none"> Detailed and comprehensive
Acceptance of results	<ul style="list-style-type: none"> Local industry 	<ul style="list-style-type: none"> Worldwide

1-Picture. Comparison of national and international standards

As shown in the table, national standards are primarily applied within the domestic market, whereas international standards are designed to meet the requirements of global competition.

To improve cotton fiber quality and produce competitive products for international markets, the following recommendations can be proposed:

Modernization of testing equipment to enhance the accuracy of results.

Implementation of education and training programs on standardization to familiarize manufacturers with international standards.

Increased integration of national and international standards to simplify export procedures.

Improvement of quality control systems through continuous monitoring and certification processes.

Conclusion:

Testing cotton fiber quality based on national and international standards is a crucial factor in producing high-quality products in the cotton industry. While national standards are suitable for meeting domestic market requirements, international standards address global demands. Modern testing methodologies and a robust standards framework contribute significantly to improving cotton fiber quality, thereby strengthening export potential.

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