

TECHNOLOGICAL AND EXPERIMENTAL METHODS USED IN DETERMINING QUALITY INDICATORS

Dilafroz Kasimova

Assistant Andijan State Technical Institute

Abstract: The scientific concept of the quality of knitted products. The essence of the quality of knitted products is determined by their aesthetic, functional and technological properties. The quality category here means not only appearance or durability, but also includes the service life of the product, its suitability for the human body, hygienic safety and compliance with production technologies. The concept of quality requires a complex, i.e. multi-criteria approach to knitted fabrics.

Keywords: Knitting, quality, Fabric, indicator, technical, aesthetic, excision, evaluation, texture.

Determining the quality indicators of knitted fabrics is an important stage in controlling the technical, aesthetic and operational compliance of the product. Quality assessment is not limited to visual inspection, but is carried out comprehensively through precise measurements, laboratory analysis and technical tests. These assessments are carried out both during the production process and at the stage of certification of the finished product.

The main quality indicators of knitted fabrics are elasticity, shape recovery, density, smoothness, color fastness, washing resistance, pilling resistance, air permeability, etc. Each of them has its own technical conditions and measurement methods. Determining the quality of knitted fabrics is based on many criteria, and this process is carried out using various assessment methods. The table summarizes these methods in four main areas:

Table 1

The main methods used to assess the quality of knitted fabrics.

Evaluation method	Description	Indicators to be evaluated
Physical-mechanical methods	Determining the technical properties of fabric through stretching, breaking, compression and bending	Stretchability, shape recovery, strength
Hygienic methods	Tests how the fabric transmits air and moisture	Air permeability, breathability, moisture absorption
Aesthetic evaluation methods	Visual inspection, evaluation of surface smoothness, hairiness and color changes	Smoothness, pilling, color fastness

Operational tests	Examines how fabric changes when washed, worn, or used	Washing resistance, deformation resistance
-------------------	--	--

Physical-mechanical methods - aimed at assessing the technical stability of the fabric, that is, the ability to stretch, tear, and restore shape. These assessments are performed on special testing machines and are the main criteria for determining the strength of the fabric. Hygienic methods - determine the level of comfort for human health by determining the air and moisture permeability of the knitted fabric. These methods are important for the fabric to "breathe" and maintain thermal balance. Aesthetic assessment methods - serve to determine the appearance of the fabric surface, such as pilling, color stability, and smoothness. These methods are crucial for the visual appeal of the product. Operational tests - determine how the knitted fabric changes in real-life conditions. This includes evaluating deformations as a result of washing, ironing, and wearing.

Table 2

Technological devices and measuring instruments used in assessing the quality of knitted fabrics.

Device/Equipment Name	Purpose of use	Indicator to be evaluated
Universal weighing machine (Instron, ZwickRoell)	Measuring tensile strength and breaking strength	Stretchability, strength
Pilling apparatus (Martindale tester)	Assessment of the degree of surface hairiness (pilling)	Pilling resistance
Air permeability tester	Determining air permeability through fabric	Air permeability
Optical profilometer / laser scanner	Measuring the smoothness of the fabric surface	Surface smoothness
Washing test devices	Evaluation of changes after washing	Washing resistance
Color stability determiner special scale devices	Comparison of color fading and color change	Color stability

This table presents special technological devices and measuring instruments used to assess the main quality indicators of knitted fabrics. Each device is aimed at determining a specific physical, aesthetic or operational property, providing an accurate and reliable assessment of quality.

Table 3

Knitting fabric quality in the evaluation normative documents .

Regulatory document	Description	Applicable indicator(s)
ISO 13934 / UzDST 2769	Determining the tensile strength of fabrics	Stretchability, strength
ISO 12945-2	Pilling resistance assessment (Martindale method)	Pilling resistance
ISO 9237	Determining the air permeability of fabrics	Air permeability
ISO 105-A02 / ISO 105-C06	Evaluation of resistance to washing and color fading	Color fastness, wash resistance
ISO 3071	Determination of pH balance (for hygienic assessment)	Hygienic safety
ISO 3801	Method for determining fabric density	Density

Knitting fabrics quality in determining not only laboratory methods , maybe this methods how criteria based on execution also important is considered . This because , international and national standards (normative) documents) test process order put gives , test conditions , measurement methods and assessment criteria by designating put it .

The research to perform on time me knitting tissues deep studying I came out . This in process knitting of fabrics main features and development about general to concepts has I am knitting . fabrics different in the fields wide use , especially their convenience and many functionality reason that I understand . This with together , fabrics quality determinant factors analysis raw material and working release processes quality in providing important importance has that I found out . From this outside , modern working release requirements suitable coming ecological and high good quality knitting of products relevance also understanding I got it . In general received , received knowledge and conclusions in the future working release processes improve and knitting products quality increase for important basis to be service does .

Knitting of threads ring in the form of each other connects and this rings on the fabric elasticity and softness gives . Example for , one directional knitting (weft - knitting) top to elasticity have , that is cloth light pressure under expands and then fast will be restored . Other from the side , many directional and knitting (warp - knitting) . less stretchable , but stronger be , he mainly medical , technical or filter materials as This is used . ideas practical at my job fabrics different to the tests in preparation me to the direction put in , which kind of to fabrics which test method suitable to come to understand help gave .

The research experimental in part me local knitting from enterprises take arrived samples laboratory under the circumstances one how many from tests I passed the tests . within elasticity tests , friction endurance , air conductivity and after washing then deformation such as indicators according to clear information For example , elasticity in the test cotton - elastane mixture (S 2 and R 2 samples) up to 30–35 percent stretched I saw this . and sports clothes and asset clothes for very important . This with together , simple cotton fabrics stretch according to a little low result showed , but after washing shape storage in terms of much more stable It was . So , the fabric in the composition elastane amount how much high if , stretch ability that much improves , but after washing then recovery level also high to be need . To friction endurance in the test synthetic from fibers organization found L 1 and L 2 samples high result showed : fibers on top speed reduce and of the fabric far term service to do in providing polyester and Lycra combination effective that it is I found out . But this synthetic mixtures sometimes air conductivity level a little reduces , this and internal clothes or medicine in the field in fabrics not much slave not to be possible .

General gathered information this showed that local knitting of enterprises working issuing some fabrics national (UzDSt 29104.2 : 2021) and international standards (ISO 13938-2, ISO 13934-1, ISO 9237, ISO 105- C 06 , ISO 105- E 04 , ISO 5077) suitable comes . But some properties , such as color stability and endurance according to improvement necessary . This because of enterprises knock - down in the model (start ' ich less expensive) test equipment installation and natural fibers with mixture again - at optimization to the issues attention their attention important .

In the future , my research based on me knitting of products hygienic to the requirements compatibility further deeper to study I am planning . In this of the fabric antibacterial coatings , moisture swallowing and steam transfer properties , skin effect how much lack of determination according to experiments take Also , " smart " textiles " — that is to the clothes inserted sensors or electricity conductive fibers with work possible technician in terms of I am learning . This direction knitting industry new to the stage take it turns out , because today's on the day not only convenient , maybe smart and functional clothes working release current from issues is one .

In general when receiving , knitting of the fabric how structure based on its formation , quality indicators for what connection and practical in tests which features priority that is about wide to the imagination has I am . This is knowledge not only theoretically , maybe practical from the side also working producers , entrepreneurs and scientific - research institutes for useful will be . If enterprises above shown recommendations done increase , local knitting products quality in terms of price worthy and at the market competitive to be remains . This with together , ecological requirements also into account take the environment protection to do help As a result , " Made in Uzbekistan " knitwear" brand not only local the market satisfies , maybe international to the market export to do opportunity also to give It is possible . and country to the economy additional income brings and technological to progress motivation It will be .

References

1. GOST 29104.2:2021. Knitted fabric. Clinical method.
2. ISO 13938-2:2019. Textiles – Bursting properties of fabrics.
3. ISO 13934-1:2013. Textiles – Tensile properties of fabrics – Part 1: Determination of maximum force and elongation at maximum force using the strip method.
4. ISO 9237:1995. Textiles – Determination of the permeability of fabrics to air.
5. ISO 105 C06:2010. Textiles – Tests for color fastness – Part C06: Color fastness to domestic and commercial laundering.
6. ISO 105 E04:2013. Textiles – Tests for color fastness – Part E04: Color fastness to water.
7. ISO 5077:2008. Textiles – Determination of dimensional change in washing and drying.
8. ISO 7770:1988. Textiles – Fabric-lofts and related characteristics.
9. Hadi, H. & Qodirov, U. (2018). Fundamentals of Textile Technology. Tashkent: “Science and Technology” Publishing House.
10. Karimov, B. (2020). Knitwear production technology. Andijan: Publishing House of the Faculty of Light Industry of the Andijan State Technical University.