



## METHODS OF STUDYING MEASUREMENTS AND ERRORS OF INTERNATIONAL STANDARD REQUIREMENTS

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### ABSTRACT

*In accordance with the requirements of the standardization organization and other organizations, along with the entry of manufacturers into the consumer market or the foreign market, the study of measurement tools and measurement errors is rapidly developing.*

*A lot of scientific research is being conducted on the unsolved problems of today's standardization field. Also, the establishment of a normative unit, parameters, dimensions and quality of production technology, testing and control of many types of international rules and norms models are left alone. Assessing the conformity of the standard characteristics of the product and verifying the conformity of the product with the technical and legal requirements of the relevant market.*

Pursuant to the decision of the President of the Republic of Uzbekistan dated December 12, 2018 PQ-4059 "On measures for further development of technical regulation, standardization, certification and metrology systems"

This Law defines the legal, economic and organizational basis of certification of products, services and other objects, including production processes, management systems, and specialists who apply for participation as employees in the field of conformity assessment, as well as the rights, obligations and responsibilities of certification participants. In the law, the concept of state standard is changed to the concept of "national standard" based on foreign experiences, as it means mandatory implementation. Because national standards are set to be applied on a voluntary basis.

The main purpose of international standards is to create a unified methodological basis for the development of new quality systems at the international level and the improvement of existing quality systems and their certification.

Scientific and technical cooperation in the field of standardization is aimed at coordinating the national standardization system with international, regional and progressive national standardization systems. Both backward countries and developed countries are equally interested in international standardization. The goals of international standardization are convergence of the quality level of products produced in different countries, ensuring



mutual exchange of elements of complex products, mutual exchange of scientific and technical information, and helping to accelerate scientific and technical progress.

It makes it possible to speed up the introduction of advanced production methods, setting the requirements for the technical level and quality of products, raw materials, semi-finished products and components, as well as standards, requirements and methods in the field of product design and production. Elimination of irrational diversity of high-quality products and types, brands and sizes, development of unification and aggregation of industrial products as the most important condition for specialization of production; aimed at complex mechanization and automation of production processes, increasing the level of interchangeability, increasing the efficiency of product use and repair.

Ensuring the unity and reliability of measurements in the country, creating and improving state standards of units of physical quantities, as well as the highest accuracy measurement methods and tools;

Adoption of uniform terms and symbols in the most important fields of science, technology, economic sectors, standards in the field of improvement of the system of labor protection standards, nature protection and use of natural resources as part of the work on the development of unified systems of documents, classification and coding systems of technical and economic information includes the formation of a system. International standards do not have a binding status for all participating countries. Any country in the world has the right to use them or not. The decision to use the ISO international standard is mainly related to the country's level of participation in the international division of labor and the state of its foreign trade.

ISO/IEC Guide 21:2004 provides for direct and indirect application of the international standard.

The ISO International Organization was founded on February 23, 1947 as a voluntary, non-governmental organization. It is a general international organization established on the basis of the agreement between the representatives of 25 industrialized countries at the meeting held in London in 1946 to create an organization with the authority to coordinate the development of various industrial standards at the international level and implement the procedure for their adoption.

Basic standards - a national standard developed and approved by the federal executive body in the field of standardization, defines the general rules for carrying out standardization work, as well as types of national standards.

Subtypes of these standards are organizational, methodological and general technical standards. As examples of organizational and methodological standards, the standards included in the Interstate Standardization System and general technical standards include the unified system of project documentation, the unified system of technical and economic information, etc.

The objects of organizational and methodological standards are terms and definitions, basic rules in the field of standardization, metrology and general technical standards, scientific and technical terms, processes of creating and using products;

environmental protection, safety of products, processes and services for life, health and property of individuals and legal entities, other general technical requirements.



Product standards are a type of standards that define quality requirements for a homogeneous or specific product.

Standards of control methods are a type of standards that determine the methods (techniques, techniques, etc.) of testing, measuring, and analyzing products during the process of creating, certifying, and using them. The requirements for control (testing) methods are regulated by the international standard GOST R ISO/IEC 17025-2017[1].

According to these documents, requirements for objectivity, accuracy and reproducibility of results are imposed on control methods. To ensure these requirements, the standards of control methods must specify the permissible measurement errors.

Standards for control methods can be divided into the following subtypes:

- acceptance and sampling rules;
- methods of determining the values of quality indicators;
- ways to identify products and services.

Acceptance and sampling rules determine the procedures and methods of acceptance of combined, point and average samples depending on the mass of the cargo, the method of packaging goods and other characteristics, the rules of sampling for laboratory tests. In addition, such standards define the cargo and its identification features.

In some cases, acceptance criteria may be given in conjunction with quality assurance methods.

The methods of determining the values of quality indicators are designed to regulate test (measurement) methods. The standards of this subtype have a regulatory structure.

For each standardized method, the standard specifies:

- test instruments and auxiliary devices (equipment, materials, reagents, etc.);
- rules for sample preparation for testing;
- test procedure;
- rules for processing and formalizing test results;
- permissible measurement error.

Standardized measurement methods have an advantage in selection and application over non-standardized ones.

An example of such subtypes is GOST R 51944-2002 "Poultry meat. Organoleptic indicators, temperature and mass determination methods.

The methods of identifying products and services are designed to determine the uniqueness or authenticity of objects based on the determination of the values of indicators that perform the function of the most important characteristics. This subtype of standards is relatively new and not many yet. The need to divide it into an independent subtype is due to the sharp increase in the production and sale of counterfeit products over the past 15 years and the need for reliable identification methods to detect counterfeiting.

This subtype is GOST 31479-2012 "Meat and meat products. The method of histological determination of the composition.

Category: Standardization, metrology, certification



Standardization is a normative method of management. Its impact on the object is carried out by establishing norms and rules formalized in the form of legally binding regulatory documents.

The standards define procedures and methods for planning product quality improvement at all stages of the life cycle, specify requirements for quality control and evaluation tools and methods. Product quality management is carried out on the basis of state, international, industry standards and enterprise standards.

SDmatic is fully automatic and takes less than 10 minutes to perform a single detection. The obtained results are in good agreement with the data of standard enzymatic methods. Grains make up 78-82% of their starch, so by studying the amount of damaged starch, we can get an idea of the quality of the flour. Complies with AACC Standard 76-31.

The device allows you to quickly determine the amount of starch in it, damaged during grinding. This quantity, in turn, reflects both the condition of the grain endosperm and the degree of mechanical impact of the rolls during grinding.

The general purpose of standardization is to protect the interests of consumers and the state in terms of the quality of products, processes and services. In addition, standardization is carried out for the following purposes:

increase the level of ensuring the safety of life or health of citizens, property of individuals or legal entities, state or communal property, environmental safety, life or health of animals or plants, and support compliance with the requirements of technical regulations ; increase the level of safety of objects, taking into account the risk of natural and man-made emergency situations; ensuring scientific and technical progress; increase the competitiveness of products, works and services; rational use of resources; technical and information compatibility; comparison of research (tests) and measurement results, technical and economic-statistical data; product exchange.

Standardization as a science and as a type of activity is based on certain starting points - principles. The principles of standardization reflect the basic laws of the standard development process, justify the need for it in the management of the national economy, determine the conditions for effective implementation and development trends.

The main goal of ISO is to develop standardization on a global scale for international trade and mutual assistance, as well as to expand cooperation in the field of intellectual,



scientific, technical and economic activities through the development of international standards.

Measurement quality means a set of characteristics, which are the accuracy characteristics of determining the results of measurements in the required form and under the specified conditions. The quality of measurements is primarily characterized by this. indicators such as accuracy (error), correctness and validity

in the practice of using measurements, a very important indicator becomes their accuracy, that is, the degree of closeness of measurement results to some real value, which measurement operations are used for qualitative comparison.

IN as a quantitative estimate, as a rule, an error is used

measurements. Also, the smaller the error, the higher the accuracy. The accuracy of the measurement result is the main quality characteristic of measurements reflecting the closeness of the error of the result.

Precision is a property of measurements that reflects the closeness of their results. to the actual value of the measured quantity. The measurement can be considered completed with the greatest accuracy, not only the result of the measurement was found, but also its assessment was carried out errors, that is, the quality of the measurement results is usually described, indicating their accuracy or error.

The second group includes: nautical mile, carat, knot, rpm.

Table 1. Basic units of physical quantities of the SI system

Name of physical quantities		Unit		
Name	symbol	Name	designation	
			international	Russian
<b>Основные</b>				
Length	L	meter	M	м
Weight	M	kilogram	Rg	кг
Time	T	second	s	с
The strength of the electric current	I	ampere	A	А
Thermodynamic temperature	Q	kelvin	K	К
Amount of substance	N	mole	mol	моль
The power of light	J	candella	rd	кд

According to the law of the theory of errors, if it is necessary to increase the accuracy of the result (with the excluded systematic error) by 2 times, then the number of measurements should be increased by 4 times; if you want to

increase the accuracy by 3 times, then the number of measurements by 9 times, etc. The measurement uncertainty assessment process is one of the most important measures to ensure the uniformity of measurements. Naturally, there is a great variety of factors affecting measurement accuracy. 1.[23]

Measurement errors are classified according to the following criteria.



1. According to the method of mathematical expression, errors are divided into absolute errors and relative errors.
2. Errors with the interaction of time change and input value are divided into static and dynamic errors
3. According to the nature of errors, they are divided into systematic errors, random errors, gross errors (missed).
4. According to the nature of the dependence of the error on the influencing quantities, the errors are divided into basic and additional.
5. According to the nature of the dependence of the error on the input value, errors are divided into additive and multiplicative.

Absolute error is the value calculated as the difference between the value of the quantity obtained during the measurement process and the true (actual) value of this quantity. The absolute error is calculated according to the following formula:  $\Delta Q = Q_n - Q_0$ , where  $\Delta Q$  is the absolute error;  $Q_n$  is the value of a known quantity obtained during the measurement process;  $Q_0$  is the value of the same value taken as a basis for comparison (actual value).

Relative error is a number that represents the degree of measurement accuracy. The relative error is calculated according to the following formula: where  $\Delta Q$  is the absolute error;  $Q_0$  is the actual (true) value of the measured value. The relative error is expressed as a percentage. GOST 8.417-81 allows the use of a number in addition to the specified units non-system units, as well as temporarily allowed units until the adoption of the relevant international decisions application. The first group includes: ton, day, hour, minute, year, liter, light year, volt-ampere.

Summary Standardization is an activity aimed at achieving the most optimal level of regulation in a specific field. The work carried out on the study of measurement tools and measurement errors, the main goal of international standards is the development of new quality systems at the international level and the improvement of existing quality systems and a uniform method of their certification. is to create the foundations. Scientific and technical cooperation in the field of standardization is aimed at coordinating the national standardization system with international, regional and progressive national standardization systems.

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