# THE ESSENCE OF TYPES OF TESTS IN IMPROVING PRODUCT QUALITY, THE IMPORTANCE OF THE LEVEL OF PRODUCT QUALITY.

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**Abstract:** This text explores the significance of various types of tests in enhancing product quality. It delves into the essence of intensified tests, covering mechanical, environmental, and non-destructive testing methods. The focus is on creating loading spectrums that influence primary quality characteristics, determining adaptability during operation, and assessing durability. The concept of confidence probability and credible probability is introduced, emphasizing the reliability of test results. Ergonomic, aesthetic, technological, economic, and social indicators are discussed as crucial elements in evaluating product quality. Ultimately, the text underscores the pivotal role of testing in ensuring the overall improvement and maintenance of high product quality levels.

**Keywords: Quality, product, ergonomic, indicator, technological, product quality.**

In the testing of mechanical equipment, loading and environmental characteristics are intensified. This includes increasing the loading frequency, intensifying pressure loading and dynamic loading, and intensifying external mechanical and climatic factors (shocks, vibrations, temperature, and loads). It aims to create a loading spectrum that strongly influences the primary quality characteristics of the object. The selection of the test mode is one of the crucial stages in organizing intensified tests [1]. The product should deviate from normal operating conditions during intensified testing, ensuring that both the quality and quantity are affected. The intensification of freezing or thawing processes reveals the true nature of the object's process of operational deterioration. The complexity of conducting intensified tests is also reflected in characterizing the load spectrum

with probable natural load factors during product operation. Operating the product in intensified mode may reveal situations that it may not encounter during normal conditions, and it can modify the representation of the freezing process.The theory of the impact on the product properties is based on conducting intensified tests, and its principles are used in organizing experiments, reworking experimental results, and learning how to generalize obtained results and methods for applying them to other objects. Intensified tests for freezing aim to assess the actual adaptability of the freezing process during operation [2]. Intensified tests provide the opportunity to shorten the test time several times, but for complex products, it may reduce the reliability of the results. The reason for the decrease in reliability is that the result of the product under intensified loading (i.e., increased load) is recalculated based on the normal operating mode, i.e., the regime in the nominal loading area. In this case, the recalculation efficiency for different product features becomes variable because a single intensifying factor affects different characteristics for different technical conditions, and the rate of change of technical conditions varies. Types of tests based on the impact type include Mechanical-mechanical factors testing, Climate-climate factors testing, Thermal-temperature factors testing, Radiation-radiation factors testing, Electric-electric loading, electric current, and electric field testing, Electromagnetic-electromagnetic field testing, Magnetic-magnetic field testing, Chemical-special chemical environment testing, Biological-biological factors testing.Also, tests for non-destructive and non-disruptive control methods are used to conduct tests that ensure that the characteristics or properties of objects, materials, components, or products remain unchanged during the entire period of their operation, or it is determined how they change after the test and what methods are used to test and define them. Non-destructive testing is considered an advantage because it allows determining the value of the characteristics of the object or testing samples, parts, or products in a single test. Non-destructive tests are considered an advantage since they allow determining the characteristics of the object, samples, parts, or products using a single test. Non-destructive tests are

essential for obtaining information about the quality, strength, technical indicators, etc. Non-destructive tests are a significant advantage as they allow obtaining information about the quality, strength, technical indicators, etc., without damaging the object.Quality indicators-by the quantity of information obtained about the product. The group testing method-for the method of determining quality indicators [3]. The results of the test depend on the batch, must be associated with the batch, and for high reliability, the number of each product should be large. The reliability of the result depends on the number of products, and to ensure high reliability, the quantity of each product should be large. Individual testing-for each product, the results are associated only with this specific sample. The results are associated only with one test sample. To account for the difference in the quality indicators, a concept of confidence probability is introduced. Confidence probability is the probability of the true value of the evaluated quantity falling within the confidence interval defined by the interval limit values. Duration tests. Durability testing is considered an intensified test that characterizes the ability of the object to perform its functions and maintain its parameters during the impact of various factors. Durability tests are also considered intensified tests because the result of this test determines the resource consumed by the product [4]. Details that are not subjected to durability testing are not tested. Durability tests are also considered intensified tests because the result of this test determines the resource consumed by the product. Details that are not subjected to durability testing should not be used after durability testing, and details or systems tested after durability testing are not suitable for use.A portion of the product, selected on the basis of the selected test method. In this case, the number of test samples is limited, and the quantity for selection is arbitrarily determined. This introduces the concept of credible probability. Credible probability is the probability that a given quantity will be credible or that its value will be credible. These distinctions are taken into account to calculate a credible probability. Qualitative analysis. Credibility of the result of an instrumental measurement, reliability, standard deviation, and other

parameters. Reliability and standard deviation. Testing reliability parameters are parameters associated with the reliability of the measurement results [5]. Testing reliability parameters are parameters associated with the reliability of the measurement results. Reliability parameters include parameters related to the confidence of the measurement result.Ergonomic indicators describe the "human-machine" system and account for the various characteristics of hygiene, anthropometry, physiology, and psychology in human life. Ergonomic indicators include the degree of comfort, ease of use, temperature level, and the compatibility of the product's construction with human capabilities in terms of speed and other factors. Aesthetic indicators describe the meaning of information, the acceptability of the shape, the integrity of the structure, and the perfect preparation of the product. It includes the originality, stylistic consistency, fashion compatibility, functional-construction correspondence, the integrity of the volumetric-phasal structure, color harmony, and others [6]. Technological indicators describe the degree of compliance with the process of production, use, and quality indicators, the conditions of production and work, minimizing costs in production, ensuring quality improvement, and measures for eliminating the reasons for poor quality, as well as economic factors affecting labor costs, wages, product interest, and others. Economic indicators include labor remuneration methods, the amount of monthly and annual bonuses, cash incentives, wages by results, earnings by the hour, piece-rate wages, the maximum size of wages, working conditions, terms of payment, and other economic factors. The material nature of payment (money, goods, material goods, securities, etc.) and the form of payment (cash, bank transfer, postal transfer, goods, and others) also play a significant role [7]. At the same time, the indicators that determine the employee's condition include the length of service, the level of education, the availability of academic degrees, and others. Social indicators include the level of education, the availability of academic degrees, length of service, and others. Social indicators are also taken into account in determining the employee's condition.Indicators of the labor force describe the

characteristics of the physical and intellectual abilities of employees, the level of their skills, and professional knowledge [8].

In conclusion, the comprehensive examination of various types of tests underscores their indispensable role in the continuous enhancement of product quality. The multifaceted nature of testing, covering mechanical, environmental, and non-destructive methodologies, contributes significantly to the identification and rectification of potential issues in diverse product categories. The establishment of loading spectrums, consideration of primary quality characteristics, and assessment of adaptability and durability are paramount in ensuring the resilience and reliability of products. The incorporation of confidence and credible probability adds a layer of statistical rigor, reinforcing the validity of test outcomes.Furthermore, the evaluation of product quality extends beyond mere technical specifications. Ergonomic, aesthetic, technological, economic, and social parameters collectively form a holistic framework for quality assessment, acknowledging the diverse facets that influence consumer satisfaction and market success. Recognizing the importance of maintaining high levels of product quality, organizations are prompted to invest in robust testing protocols and methodologies.

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