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MEASUREMENT CONDITIONS FOR METROLOGICAL SUPPLY OF PRODUCTION

Raxmonov Furqat Abdusakimovich

Senior teacher of Jizzakh Polytechnic Institute

Phone: +998915660664; furqatraxmonov772@gmail.com

Annotatsiya

Mahsulot sifati ko'satkichlari parametrlarini o'lchash natijalarining ishonchligi normal shartli o'lchovlarni hisobga olgan holda o'lchov vositalarini to'g'ri tanlash orqali erishiladi.

Аннотация

Достоверность результатов измерения параметров показателей качества продукции достигается за счет правильного выбора средств измерений с учетом нормальных условий измерения.

Kalit so'zlar: Metrologik ta'minot, o'lchash shartlari, o'lchov natijasi, normal sharoit, o'lchash asboblari, sifat ko'satkichlari, o'lchash xatolar.

Ключевые слова. Метрологическое обеспечение, условия измерения, результат измерения, нормальные условия, средства измерений, показатели качества, погрешности измерений.

Metrological support of production should ensure the optimization of process control, ensure the efficiency of processes, maintain the quality of manufacturing, storage and operation of products, taking into account the receipt of measurement results depending on the accepted conditions [1].

Measurement conditions have a significant impact on the measurement result and include ambient temperature, relative humidity, atmospheric pressure, mains voltage and much more, according to the work being done.

To quantify product indicators, it is necessary to: select parameters, characteristics; establish the degree of confidence with which the selected parameters should be determined; establish standards of accuracy; choose methods and means of



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measurement to achieve the required accuracy; ensure the operability of measuring instruments by linking them to the corresponding exemplary ones with the provision of periodic verification and calibration of measuring instruments; ensure that the required conditions for measurements are taken into account or created; provide processing of measurement results and evaluation of error characteristics. Consistent observance of these requirements contributes to obtaining reliable measurement results, thereby ensuring the unity of the measurements [4].

Depending on the types of products and their parameters, the measurement conditions affect the measurement results. Therefore, operators must take measures to eliminate emerging errors in the measurement results, compensate them, take into account their influence by introducing corrections, and also strive to create normal measurement conditions.

Normal measurement conditions are measurement conditions characterized by a set of values or ranges of values of influencing quantities under which a change in the measurement result is neglected due to smallness. The normal value of the influence quantity is the value of the influence quantity set as the nominal value. As normal values or the range of normal values of influencing quantities, the ambient air temperature is usually taken $-20 \pm 5^\circ \text{C}$; atmospheric pressure $101.325 \pm 3.3 \text{ kPa}$ ($760 \pm 25 \text{ mmHg}$); relative humidity $30\text{-}80\%$ [5].

The indicated normal conditions for the use of measuring instruments, as a rule, are not the working conditions for their operation. Therefore, for measuring instruments, the range of values of the influencing quantity is usually determined, specified in the technical specifications

or standards, at which the value of the additional error should not exceed the established limits.

The main error of measuring instruments is usually calculated for the normal value, to which the results of many measurements performed under different conditions are reduced.

The normal range of values of the influencing quantity is the range of values of the influencing quantity, within which the change in the measurement result under its influence can be neglected in accordance with the established accuracy standards. The accuracy standards when choosing measuring instruments in accordance with



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the purpose is the accuracy class of measuring instruments, expressed by the limits of permissible (basic and additional) errors, as well as other characteristics that affect accuracy. The limits of permissible basic and additional errors of measuring instruments are established for each accuracy class in the form of absolute, relative and reduced errors.

The limits of permissible basic error are the extreme (largest and smallest) deviations of the values of the nominal static transformation function established for normal conditions, at a given confidence level, located symmetrically on both sides of this function. The limits of permissible basic error contain random and systematic error components. The limits of permissible additional error are the largest and smallest permissible values of additional error caused by measurement conditions that differ from normal.

In addition, it should be noted that under working conditions, measuring instruments can be affected by external influences that do not directly affect the measurement results (aggressive environments, dustiness), mechanical influences (shocks, shaking, vibrations), as well as radiation and electromagnetic fields during actions of which it is impossible to make an accurate measurement [3].

In this regard, measuring instruments designed to operate under these conditions are protected by special devices. Depending on the degree of protection from external influences and resistance to them, measuring instruments are divided into ordinary, vibration-resistant, dust-proof, splash- and moisture-proof, gas-proof, spark-proof, explosion-proof, etc. Under specific measurement conditions, the use of measuring instruments with one or another type of protection allows selection in relation to specific working conditions.

The correct acquisition of measurement results is determined by the following three conditions:

- Measurement results are expressed in legal units;

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