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ENSURING THE UNITY OF MEASUREMENTS AND ETALONS

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Abstract:
Ensuring the unity of measurements and the subject of étalones are very important in science, technology and everyday life. Through measurements, humans try to understand, research, and manipulate the world around them. Therefore, measurements need to be accurate, reliable and universal. This is done by ensuring the unit of measurements and by Etalons.

Keywords: Etalons, technology, electric current strength, physical size, theoretical bases, measurements

A unit of measurement is a standard quantity adopted to represent a given physical magnitude. For example, there are units defined to measure physical magnitudes such as length, mass, time, temperature. They must be the same globally so that the measurement results can be compared and matched in different places and conditions. Without a unit of measurement, the results of measurements become incomprehensible and unreliable. International standards have been developed to provide measurement units and incorporate them into a single system. The most famous is the international system of Units or SI (Système International d'unités). The SI system defines units for all major physical magnitudes and connects them with each other. For example, meters, time seconds, mass kilograms, electric current strength amperes, temperature kelvin, amount of matter moles and light intensity Candela units are adopted as the main unit of length. On the basis of these units, all other units are formed.[1]

Etalons are standard samples or devices created to store and distribute units of measurement. With the help of Etalons, measuring instruments and equipment are calibrated, their accuracy and accuracy are ensured. Étalones are constantly monitored and updated if necessary. They represent the exact value of physical quantities and are the only source of units of measurement. In history, the

development of units of measurement and étalones was one of the important stages of human development. In the early days, measurements were based on local traditions and experiences. Specific units were used in each area, such as units such as arm, step, inch for length. Difficulties were encountered in trade and scientific communication as these units were unclear and varied in different regions. Therefore, there was a need to create a unified measurement system internationally. With the development of Metrology in the 19th century, the first efforts to standardize units of measurement began. In 1875, the International Convention of Weights and measures was adopted and, according to it, international cooperation in metrology was established. In the process, units of measurement were established based on the meter system, and étalones were created. The SI system is constantly improving. For example, it was originally perceived as a metal tape benchmark stored in Paris to represent meter length. Later, the definition of metre is determined using physical constants based on the speed of light. This ensures that the measurements are more accurate and stable. Currently, units of measurement are being redefined on the basis of scientific advances in metrology, which will serve the development of technology and science.[2]

There are many types of étalones. They differ depending on the type of physical magnitude. For example, a laser interferometer is used as a length benchmark, atomic clocks as a time benchmark, and a specially prepared kilogram sample as a mass benchmark. Each benchmark is distinguished by its high accuracy and stability. With the help of Etalons, measuring instruments are calibrated and their malfunctions are obtained.[3]

Ensuring a unit of measurement and étalones play an important role in all areas of Technology, Industry, Science and everyday life. In industry, for example, precise measurements are required to control the quality of products. In medicine, measurements for drug dosage and diagnostic results must be reliable. In scientific research, however, the accuracy of measurements is decisive in creating new discoveries and theories. In addition, a unified system of measurement units is also important in international trade and the economy. In order for products produced in different countries to be comparable and meet quality standards, it is necessary that the measurements are the same. This ensures the efficient functioning of the global

economy. International cooperation in the field of measurement units and Etalons is constantly developing. Metrology organizations exchange experiences, develop new standards and introduce them. This process is closely related to technological advances and scientific discoveries. Therefore, ensuring the unity of measurements and creating Etalons is an area that requires constant attention.[4]

The SI system is an international standard system of units of measurement, created with the aim of providing the same measurements in scientific, technical and everyday life around the world. This system allows for accurate and consistent representation of measurements, as well as ensuring the consistency of measurements between different areas. The SI system is constantly improving in connection with the development of modern science and technology, and new units and standards of measurement are introduced. The main purpose of the SI system is to make measurements in accordance with uniform and global standards. This ensures that measurements are accurate and reliable in scientific research, industrial production, trade and everyday life. In different countries, units of measurement may vary, but the SI system eliminates these differences, creating a unified language for all. Thus, international cooperation becomes easier and the efficiency of technological processes increases. The foundation of the SI system is based on seven basic units. They are designed to measure length, mass, Time, electric current strength, temperature, amount of matter, and light intensity. Each basic unit has a clear physical definition, and their measurements are constantly revised and updated on the basis of modern scientific discoveries. With these units, all other units of measurement are formed, and they work together. The unit of length of the SI system is called the meter. While the meter is traditionally based on some particular physical event or object, today it is defined as the path that light travels through in vacuum in a given period of time. This definition makes it possible to measure the meter with great accuracy and is widely used in scientific experiments. Length measurement is also very important in everyday life, and it is used in many industries, such as construction, transport, industry, etc. Mass measurement is expressed in kilograms. The kilogram is the basic unit of mass in the SI system, and it has a clear physical definition. Whereas the definition of a kilogram previously used solid bodies or special standards, it is now based on fundamental physical constants such as the

Planck constant. This ensures high accuracy and stability in weight measurement. Mass measurement is widely used in industrial production, scientific research and everyday life. The time measurement is done in seconds. The second is the basic unit of time in the SI system and is determined using atomic clocks. Atomic clocks are very stable and accurate time gauges based on the resonant frequency of atoms. Time measurement is important in science, technology, transportation, and many other fields. Time can be accurately measured and controlled using seconds.[5]

Electric current power is measured using amps. Ampere is the basic unit of electric current strength and has a definition based on the magnetic force between two interacting conductors. Electric current power is widely used in the fields of modern technology, electronics and energy. With Ampere, the power, voltage and other parameters of the electric current are measured. Temperature measurement is represented by kelvin. Kelvin is the basic unit of thermodynamic temperature in the SI unit system. Kelvin has a clear and scientifically based definition in temperature measurement, which depends on the energy of motion of atoms and molecules. Temperature measurement plays an important role in the processes of chemistry, physics, biology and industry. Using Kelvin, the temperature can be measured accurately and reliably. The amount of substance is measured in moles. The mole is the basic unit of the amount of matter in the SI system, which represents the number of atoms, molecules or other small particles. Using a mole unit, it is possible to accurately understand and measure chemical reactions, composition of substances and other scientific processes. The unit is widely used in the fields of chemistry and biology. Light intensity is measured in Candela. Candela is the basic unit of measurement for the part of light visible to the human eye. This unit makes it possible to accurately measure the brightness of light sources. Light intensity is important in learning, industry and everyday life, being used, for example, in the evaluation of lamps, displays and other light sources. The SI system constantly develops on the basis of international cooperation. Scientists and experts from different countries of the world gather each year to work on improving measurement standards, introducing new units, and upgrading existing units. This process is carried out in accordance with scientific discoveries, technological innovations and

practical needs. At the same time, the SI system is accepted as the only standard in all areas, and its use is mandatory.[6]

Conclusion:

In conclusion, ensuring the unity of measurements and ethalones are the basic principles and tools of mankind in the field of measurements. With them, measurements are accurate, reliable and universal, and are used in various fields. In the course of historical development, units of measurement and Etalons have become constantly improved and remain a fundamental part of modern science and technology. Through these systems, humanity becomes more deeply aware and guided by the world around it, which forms the foundation of progress.

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