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### **The substance of metrological supply and measurement of ultrasonic power in the water environment**

Ultrasound in the aquatic environment is widely used in practically many industries, in science and in the social sphere, including: in the chemical, food and pharmaceutical industries for the intensification of physical and mechanical processes - spraying liquids, emulsification, drying, cleaning, combustion; when measuring the level or flow of liquid; in machine and instrumentation for cutting hard and brittle materials, welding and soldering; in ultrasonic defectoscopy; in navigation and sound transmission. But the widest range of ultrasounds, including the megahertz frequency range, is used in medicine - in diagnostics, therapy and surgery.

An indispensable condition for the effective use of ultrasound is the accurate measurement of its characteristics and reliable control of the output acoustic parameters of the equipment. In medicine, for example, an inadequate level of ultrasound does not achieve a therapeutic effect, a reliable diagnosis can not be established.

There was an important need for the establishment of a metrological system for measuring the basic parameters of megahertz ultrasound and building, in the first place, the standards of units of measurement of physical quantities that characterize the ultrasound field. One of the main parameters of an acoustic field, which is normalized for all types of ultrasound equipment, is the power of an ultrasonic beam generated by an ultrasonic emitter.

The purpose of the work is to substantiate and develop the scientific and technical bases of metrological support for measuring the power of ultrasound in the aquatic environment in order to achieve unity and the necessary accuracy of measurement in megahertz frequency range in Ukraine.

For achievement of the set goal the following tasks are formulated - to analyze problems of construction of standards of units of measurement; - to perform theoretical studies of the peculiarities of the propagation of high-frequency ultrasound in the aquatic environment; - to develop a mathematical model of measurement during the reproduction of the unit of power of ultrasound emitted in the aquatic environment; - to create a standard unit of ultrasound power in an aquatic environment; - to carry out experimental researches to determine the metrological characteristics of the created standard.

That is, for the safe and effective use of ultrasound, sufficient accuracy and reliability of the measurement results, which would be traced to the SI system standards and recognized internationally are required.

**Conclusions** The presented researches are devoted to substantiation of metrological maintenance and measurement of ultrasonic power in an aqueous environment.

### **References**

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