

**PRODUCT QUALITY ASSESSMENT USING NON-INVASIVE MEASUREMENT
METHODS BASED ON ULTRASOUND TECHNOLOGIES****Fattayev Muhammadjon Avazbek o'g'li***Andijon mashinasozlik instituti "MSMSM" kafedراسى stajyor-o'qituvchisi,***Mo'minova Xolidaxon Dilxushbek qizi***Andijon mashinasozlik instituti talabasi "MSMSM" yo'nalishi 4-bosqich talabasi*

Abstract: *In this article, the principle of operation, advantages and disadvantages of measuring instruments in product quality management based on ultrasonic technologies, i.e., non-destructive control method, are presented, and recommendations are developed.*

Keywords: *operation, quality, non-destructive, control, method.*

Annotatsiya: *Ushbu maqolada ultratovushli texnologiyalar ya'ni putur yetkazmasdan nazorat usuli asosida mahsulot sifatini boshqarishdagi o'lchash vositalarining ishlash printsipi, avfzalliklari va kamchiliklari keltirilgan hamda tavsiyalar ishlab chiqilgan.*

Kalit so'zlar: *operatsiya, sifat, putur yetkazmasdan, nazorat, usul.*

Аннотация: *В данной статье представлены принцип работы, преимущества и недостатки средств измерений в управлении качеством продукции на основе ультразвуковых технологий, т. е. метода неразрушающего контроля, и разработаны рекомендации.*

Ключевые слова: *операция, качество, неразрушающий контроль, метод.*

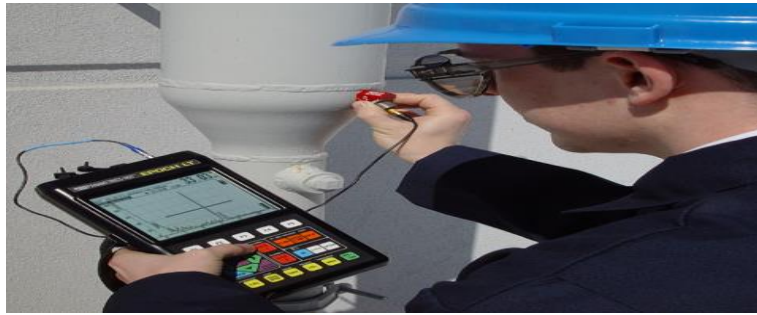
One of the most effective methods of non-destructive testing is ultrasonic testing. During the study, high-frequency vibrations are sent into the product. If there is a defect in their path, the waves deviate from the original direction and become distorted. Ultrasonic flaw detectors are used for measurements. Based on the nature of the distortions, a specialist can determine the type of defect, its shape and location.

WORKING PRINCIPLE

Ultrasonic flaw detection allows you to determine the parameters of existing defects. In particular, the distance to them can be found by estimating the propagation time of the waves. The relative size is determined by the amplitude of the reflected pulse. Ultrasonic testing equipment comes in several types.

Ultrasonic testing devices usually include several functional elements:

- High frequency pulse generator.
- Wave receiver.
- Sensor.
- The device to which measurement results are output.



Moving in a homogeneous medium, ultrasonic vibrations do not change their direction. If, for example, there is a crack along the way, some of the waves will be reflected from it, which will be registered by the receiver. The obtained data is displayed on the monitor of the ultrasonic flaw detector. By the time of registration of reflected waves, you can find out where the defect is located and the main characteristics of the latter.

Using the device, you can carry out ultrasonic quality control of welded joints, establish the coordinates and dimensions of defects. It makes it possible to find flaws in metal and plastic products. Ultrasonic non-destructive testing allows you to detect pores, lack of fusion, and other structural defects.



ADVANTAGES OF THE METHOD

Ultrasonic testing of concrete and other materials is convenient because the surface being examined requires virtually no preparation. To obtain accurate data, you only need to clear the sample of paint and then lubricate it with machine oil. This is necessary for better propagation of ultrasonic pulses. Among the advantages of the method:

- ✓ It is completely safe for people around.
- ✓ The examination with a flaw detector is carried out very quickly and with great accuracy. Electronic devices allow you to get results instantly.
- ✓ Low cost.
- ✓ The equipment is compact and mobile.
- ✓ Ultrasonic testing of pipelines and other products can be carried out at an existing facility.
- ✓ Examinations with a flaw detector do not cause any damage to the object.

✓ The method allows you to detect flaws both on the surface of the product and inside it.

Ultrasonic testing of metal and other materials allows not only to identify defects. With its help, you can obtain data on the characteristics of the material and product parameters.

DISADVANTAGES OF ULTRASONIC TESTING

All non-destructive testing methods have their disadvantages and limitations. Ultrasonic flaw detection is no exception. Among its disadvantages:

- It is impossible to establish the real size of the defect.
- If ultrasonic testing of metal with a coarse-grained structure is carried out, difficulties may arise. The reason is significant scattering and strong attenuation of waves.
- The need for special surface preparation before introducing ultrasonic pulses into the metal.
- The person taking measurements with the device must be highly qualified.
- If the surface of the test sample is rough, there are irregularities on it, or the product is too small in size, thickness or irregular in shape, then measurements with a flaw detector are quite difficult.
- To conduct the study, it is necessary to ensure direct contact between the product and the device.

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