

## **Determination of the Local Elastic Moduli of Shungite by Laser Ultrasonic Spectroscopy**

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**Abstract :** In our study, the object of laser ultrasonic testing was plane-parallel plate of shungit (length 41 mm, width 31 mm, height 15 mm, medium exchange density 2247 kg/m<sup>3</sup>). We used laser-ultrasonic defectoscope with wideband opto-acoustic transducer in our investigation of the velocities of longitudinal and shear elastic ultrasound waves. The duration of arising elastic pulses was less than 100 ns. Under known material thickness, the values of the velocities were determined by the time delay of the pulses reflected from the bottom surface of the sample with respect to reference pulses. The accuracy of measurement was 0.3% in the case of longitudinal wave velocity and 0.5% in the case of shear wave velocity (scanning pitch along the surface was 2 mm). On the base of found velocities of elastic waves, local elastic moduli of shungit (Young modulus, shear modulus and Poisson's ratio) were uniquely determined.

**Keywords :** laser ultrasonic testing , local elastic moduli, shear wave velocity, shungit

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