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Creation, Use and Prospects for Development of an Optical Measuring Complex for Diagnosing the State of Materials and Products

Abstract: An optical measuring complex enabling solution of all the measurement problems occurring during studying the physical and mechanical properties of new materials and in the process of diagnosing the state of structural materials by acoustic active methods of non-destructive testing has been described. Technical solutions and original specialized software integrated into the proposed complex have been substantiated in the frame of the computational, theoretical and experimental research, and achievement of the expected technical and functional parameters have also been confirmed during the trial operation conducted to solve the various relevant measurement problems. The use of the created complex makes it possible to increase the information value and reliability of measurement results by up to 20–30%, and also improves the quality of measurement results by up to 20–40%.

The technical solutions implemented in the proposed complex are protected by the patents of the Russian Federation for inventions, and the software is protected by the certificates of state registration of computer software.

The proposed complex is intended to be used as a part of both stationary and mobile diagnostic systems in instrument engineering, mechanical engineering, shipbuilding, aircraft engineering, the fuel and energy complex, etc.