

Summary

Today it is impossible to imagine machine-building production without the use of steel. Due to the good mechanical properties of steel, responsible parts are made. Therefore, today non-destructive testing of steel is an urgent task.

The diploma project consists of four sections. In the first section of the diploma project, an analytical review was conducted, in which the object of control was considered. Analysis of methods of non-destructive testing of steel, their advantages and disadvantages. In the second section, a direct combined piezoelectric transducer, acoustic and electroacoustic path were calculated. The structural scheme, and on its basis functional is developed. All nodes of the functional scheme are calculated and coordinated.

The third section reviews the technology of making a direct combined piezoelectric transducer. And also creation of its 3D model in the SolidWorks software environment.

In the fourth section, error calculations were performed. Based on calculations and designs electrical circuit diagram.

The diploma project consists of an explanatory note of 65 pages, includes 13 illustrations, 1 table, 16 drawings and 60 formulas.

Keywords: ultrasonic control, longitudinal waves, ultrasonic speed, non-destructive testing, ultrasonic thickness measurement