ABSTRACT

Master's thesis consists of 116 pages. It includes 26 illustrations, 26 tables, 3 annexes, 72 bibliographic titles.

The urgency of the work is in the acute need for EMA flaw in various industries, no flaw based EMA converters with high accuracy and automatic calibrator.

The aim is to develop a control system geometric parameters of physical and mechanical material blanks electromagnetic-acoustic method.

The object of research is the process of controlling the physical and mechanical parameters of the material using electromagnetic-acoustic transducer.

The subject of research is the system of control of physical and mechanical parameters of the material using electromagnetic-acoustic transducer.

Methods: theoretical study - mathematical modeling (C ++, Excel, MathLab, MatCAD), experimental studies - laboratory simulation, prototyping, full-scale experiment.

Scientific novelty:

1) resulting system dependencies acoustic wave parameters that affect the measurement of physical and mechanical parameters and building of mathematical models of control of physical and mechanical parameters by parameters EMA converter;

2) experimentally demonstrated the possibility of using electromagnetic-acoustic transducer to determine the physical and mechanical parameters of material goods;

3) The influence of external parameters affecting the EMA transducer and proposed methods address these shortcomings;

4) investigated ways to improve ultrasonic flaw detection.

Keywords: EMA, transducer, acoustic pressure, nondestructive testing, parameters, flaw detection.