

## **ABSTRACT**

Graduate work: 95 p., 5 sec., 9 tables, 33 fig., 34 references.

**BAINITIC CAST IRON; TRIP-EFFECT; UNIFORM PLASTIC DEFORMATION; DEFORMATION STRENGTHENING; MARTENSITE TRANSFORMATION; MECHANICAL TESTS FOR COMPRESSION**

The object of the research — the structure of bainitic cast iron with spheroidised graphite after heat treatment; mechanical properties (deformation to destruction, yield point) at different temperatures of tests (20 °C, 50 °C, 100 °C); the speed of hardening and the value of uniform plastic deformation.

Work purpose — establishing temperature and time parameters of heat treatment that provide implementation of TRIP-effect for creating necessary level of mechanical properties for bainitic cast iron which is used in manufacturing of agricultural machinery parts.

Research method — X-Ray analysis of bainitic cast iron structure, mechanical tests for compression and bending, photographic analysis of fracture.

The most complete structure formation of bainitic cast iron takes place after isothermal quenching at temperature 350 °C during 2 hours. The speed of hardening significantly increased with rising of test temperature, mostly in the beginning of deformation. Such behavior of the material can be explained by a rapid reducing of the amount of formed deformation martensite at increasing temperature. It is matched with the flow of processes during implementation of TRIP-effect.

The obtained results testify to the possibility of improving the operational characteristics of agricultural equipment by using bainitic cast iron as a material for the plows and cultivators.