

Abstract

Master's dissertation: 94 pages of 34 drawings, 33 tables, 1 supplement, 17 bibliographic titles.

Object of research: sensory elements of strain gauge measuring systems.

Subject of research: strain gage resistor systems with mechanical deformation amplifiers.

The purpose of the study: the study of a sensitive element strain gauge deformation, which measures the relative deformation in the range $-3 \cdot 10^{-3} \dots + 3 \cdot 10^{-3}$ with an accuracy of 0.5%. To conduct an experimental study of a strain gauge sensor to determine the relevance of its mathematical model.

Research objectives:

- to review and analyze the materials on the topic;
- according to the metrological characteristics choose the material from which the components of the sensor will be made, strain gage, digital amplifier;
- to study the metrological characteristics of the device;
- to make calculations for accuracy, reliability;
- to conduct an experimental study.

Relevance of the study: in large-scale buildings and spans, such as production shops, covered car parks, exhibition centers, large pavilions, bridges, heavy loadings are present on supporting supports. As a result of overload, the supports are destroyed, which results in damage to equipment, destruction of industrial and public objects, financial losses and lethal consequences. This is most often due to the accumulation of large amounts of snow on the roofs in the winter, as well as the loading of bridges by trucks.

Scientific novelty of the obtained results: the strain gauge sensor has a digital output signal, while the substitutes have an analog signal.

Recommendations on the use of work results: this instrument should be used to determine the deformation and the magnitude of the displacement of loaded constructions of buildings, such as bridge supports, workshops, etc.

Publications: "The elastic element of a digital converter of relative deformations with mechanical amplifier" XIV All-Ukrainian scientific and practical

conference of students, postgraduates and young scientists "Efficiency of engineering solutions in instrument making"

Keywords: strain gauge, deformation, sensing element, amplifier.