DIGITAL IMAGE CORRELATION TECHNIQUE FOR STRAIN MEASUREMENT OF ALUMINIUM PLATE

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ABSTRACT

The Digital image correlation technique recently developed is an image identification technique to be applied for measuring the object deformation. This technique is capable of correlating the digital images of an object before and after deformation and further determining the displacement and strain field of an object based on the corresponding position on the image. Digital Image Correlation (DIC) is an upcoming experimental stress –strain analysis technique and has certain advantages over others. DIC can be tested on almost all material with a large area of inspection and no pre treatment is required as compared to other optical methods. DIC uses the principle of image correlation and produces strain field by analyzing the movement of marked points on the subject. The Digital Image Correlation (DIC) is a state of art technique that can be used for accurate strain measurement. Because of its capability for fast data acquisition, this technique is well suited for the characterization of material properties both in the elastic and plastic ranges. It also has advantages of full field, non- contact, and considerately high accuracy for displacement and strain measurements. The MATLAB software is an innovate system that uses the digital image correlation technique to provide strain measurements in a two-dimensional contour map for planar surface specimens.

TRIBOLOGICAL INVESTIGATION ON B83 BABBIT REINFORCED WITH SILICON CARBIDE NANOPARTICLES

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ABSTRACT

B83 Babbit is the most popular material for fabrication of sleeve bearings by casting, hard facing, and metallization in Russian engineering. In addition to a low friction coefficient, this alloy has such attractive properties as rapid conformability, good thermal conductivity, high impact viscosity, and compatibility with oil. However, low fatigue strength upon alternating loads and moderate wear resistance of Babbit decrease the operating life of items made of it. The introduction of ceramic particles into a matrix alloy can increase the load-bearing capacity and the wear resistance of composite materials. Metal matrix composites reinforced by nanoparticles are very promising materials, suitable for a large number of applications. These composites consist of a metal matrix filled with nanoparticles featuring physical and mechanical properties very different from those of the matrix. The nanoparticles can improve the base material in terms of wear resistance, damping properties and mechanical strength. This study focuses on preparing B83 Babbit metal matrix composites with SiC reinforcements for various compositions. Various tribological properties such as tensile strength, compressive strength, ductility hardness, wear will be studied.