

EXPERIMENTAL APPLICATION USING SHADOW MOIRÉ TECHNIQUE IN TENSILE TEST

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Non-destructive testing can determine the occurrence of failures individually material and among them are the optical methods that use optical interferometry and produce fringes to determine strain and stress rates of an object. The moiré techniques are based on the moiré phenomenology and characterized to be an effect resulting from the geometrical interference between two or more overlapping grids, generating patterns of lucid and dark lines which are denoted by moiré fringe patterns. The shadow moiré technique consists in designing a grid ahead of the object that serves as a reference grid. The shadow of the projected grid on the object generates a second grid, in this case works as a grid object and interacting with the reference grid to the formation of fringes. The experiment was consisted of submitting a standardized test piece to a strain test in universal testing machine and verify, through the shadow moiré technique, the behavior of the specimen surface. The different coloring in the treatment of the images, because it is a tensile test, can be associated with the distribution of stress and deformation along the specimen. Indeed, where there is greater concentration of tension is where the breakdown occurs, therefore it is suggested that the shadow moiré techniques in tensile test showed the region of greatest tension and subject to breakdown. The studies of plots showed the existence of relationship between the number of fringes and the information about the material. To explore this result would be necessary to capture the image at the time of a test and check the displacement of the fringes and, consequently, the distribution of stress and strain field. The continuity of this work may add innovations in the analysis of stresses and strains materials, thus contributing to other areas to take ownership of this methodology and use these methods to the development of knowledge and science.

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