Experimental investigation of the tensile test using digital image correlation (DIC) method

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ABSTRACT
The Digitial Image Correlation (DIC) method is a non-contact optical technique to measure the contour deformation, strain and stress values. In order to obtain the stress and strain values, three methods have been used to investigate the tensile properties, which are experimental, strain gauge measurement, and DIC methods. The tensile specimens were fabricated with three types of materials, which were aluminium A1100, glass fiber-reinforced plastics, and pure resin plastics. It was concluded that three methods provided the closed values on Young modulus, and tensile specimen with aluminium material had the highest value with an average 171.22 GPa compared with the other two materials. In addition, it was highlighted that the DIC method had a bit higher value than the experimental method, which is still recommended to approximately predict the tensile properties.

KEYWORDS
Aluminium; Digital image correlation; Glass fiber-reinforced plastics; Tensile properties; Tensile test

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