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ON SINTERING
XII WRTCS

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**Experimental evaluation of mechanical anisotropic material behaviour
of carbon reinforced PET-G material**

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Carbon reinforced polyethylene terephthalate materials are proposed in additive manufacturing (AM) for the purposes of production of moderately loaded polyester based parts. Scientific papers show that mechanical properties of these materials are substantially influenced by its build orientation regarding printing angle.

In this study, Digital Image Correlation (DIC) was used as an experimental method for evaluating mechanical anisotropic material behaviour of carbon reinforced polyethylene terephthalate with added glycol (PET-G). Experimental evaluation of linear-elastic behaviour of carbon reinforced PET-G test samples with different printing orientation angles was performed. It was confirmed that different printing orientation angles (0°, 15°, 30°, 45°, 60°, 75°, 90°) strongly influence final mechanical properties of this type of material. For each sample obtained by different printing orientation angle, linear-elastic material behaviour model was determined by modulus of elasticity and yield stress. Obtained results proved that carbon reinforced PET-G material exhibits significant anisotropic material behaviour.