

## Investigate the Effects of Geometrical Structure and Layer Orientation on Strength of 3D-FDM Rapid Prototyped Samples

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**Abstract :** Rapid Prototyping (RP) technologies enable physical parts to be produced from various materials without depending on the conventional tooling. Fused Deposition Modeling (FDM) is one of the famous RP processes used at present. Tensile strength and compressive strength resistance will be identified for different sample structures and different layer orientations of ABS rapid prototype solid models. The samples will be fabricated by a FDM rapid prototyping machine in different layer orientations with variations in internal geometrical structure. The 0° orientation where layers were deposited along the length of the samples displayed superior strength and impact resistance over all the other orientations. The anisotropic properties were probably caused by weak interlayer bonding and interlayer porosity.

**Keywords :** building orientation, compression strength, rapid prototyping, tensile strength

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