

Modeling, Finite Element Analysis, and Optimization of Non-Pneumatic Tyre (NPT)

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Abstract: *Non-Pneumatic Tyre (NPT) as the name suggests is a type of tyre that doesn't use air to support the load. Even though tyres made out of solid rubber exist, they don't have enough compliance and will not provide a supple ride if used in normal vehicles. Non-Pneumatic tyres are introduced to overcome the disadvantages of pneumatic tyres. They are introduced with a compliant cellular solid spoke component which functions as air of a pneumatic tyre. The objective of this work is to design and analyse honeycomb spokes for NPT tyre which can withstand static conditions of an All Terrain Vehicle (ATV) under macroscopic uni-axial loading condition. Three types of honeycomb spokes models are analysed using ANSYS finite element analysis to study about the deformation and stresses developed.*

Keywords: Non-Pneumatic Tyre (NPT), Static analysis of Non-Pneumatic Tyre, Design approach of Non-Pneumatic Tyre(NPT), Honeycomb Structure, Airless tyres

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