



ABOUT US

Qantur Technologies is the authorized distributors of ANSYS engineering simulation products and services in India, Srilanka & Bangladesh. We also partner with AlphaSTAR for advance composite & polymer/metal additive solutions within India and United Arab Emirates.

Our strength lies in our focused relationships and commitment towards our partners, which makes us a preferred and trusted choice in delivering engineering solutions to our customers.



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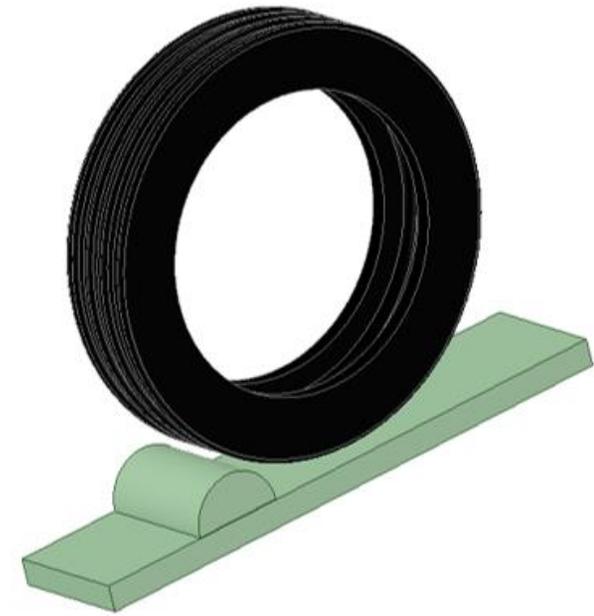
RUBBER TIRE SIMULATION IN ANSYS



PROBLEM DESCRIPTION

Rubber tire manufacturer wants to understand the performance of rubber tire under different loading conditions. In order to understand the tire design performance mainly three tests are required namely, tire inflation, foot print analysis and rolling analysis. These tests help in controlling the vehicle fuel economy, tire wear, durability and vehicle handling.

Tire and rubber industry have always been facing various technical challenges and pioneering numerous states of the art technologies in regards to engineering design, manufacturing, application and as well the engineering simulations. Tires are complex in analysis due to geometry, material and service conditions. New tire development is highly a complex process consisting of many engineering activities.



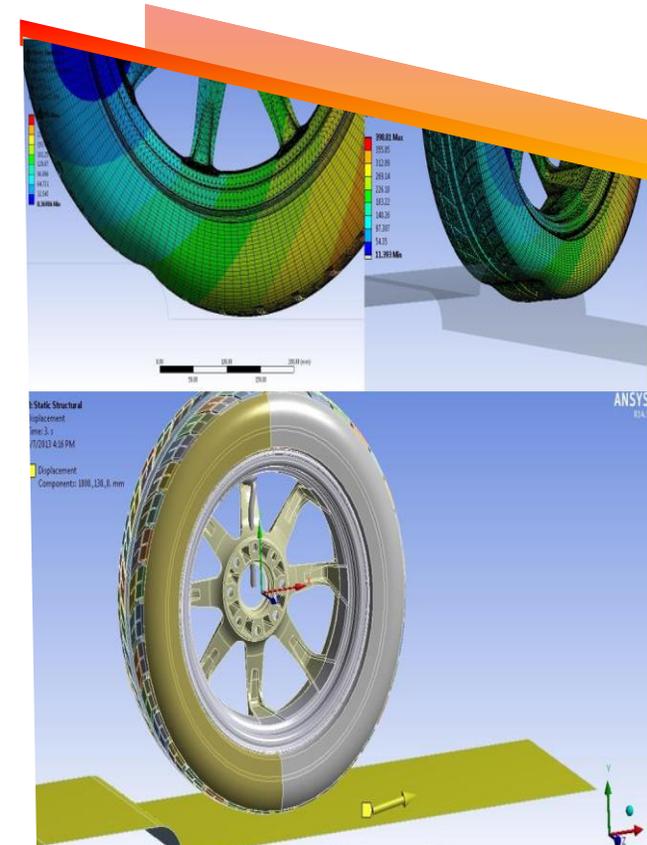
UNDERSTANDING

The performance prediction of rubber tire is a complex process and if manufacturer goes with physical testing of each tire, then it will become costly and time-consuming process. Therefore, engineering simulation can help in prediction of tire design performance at low cost with minimum time. ANSYS Mechanical can predict the deformation, stresses and contact pressure between tire and road under different loading conditions such as tire inflation, foot print and rolling to improve tire design performance.

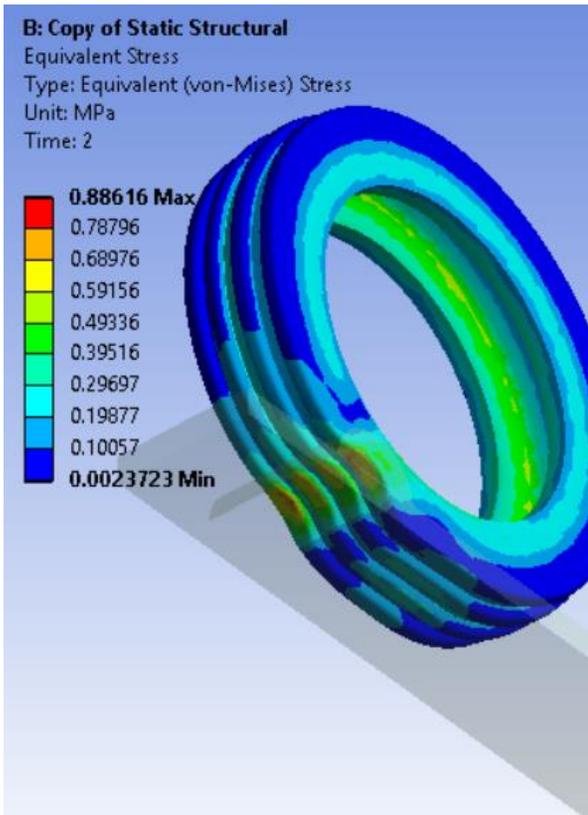


SOLUTION

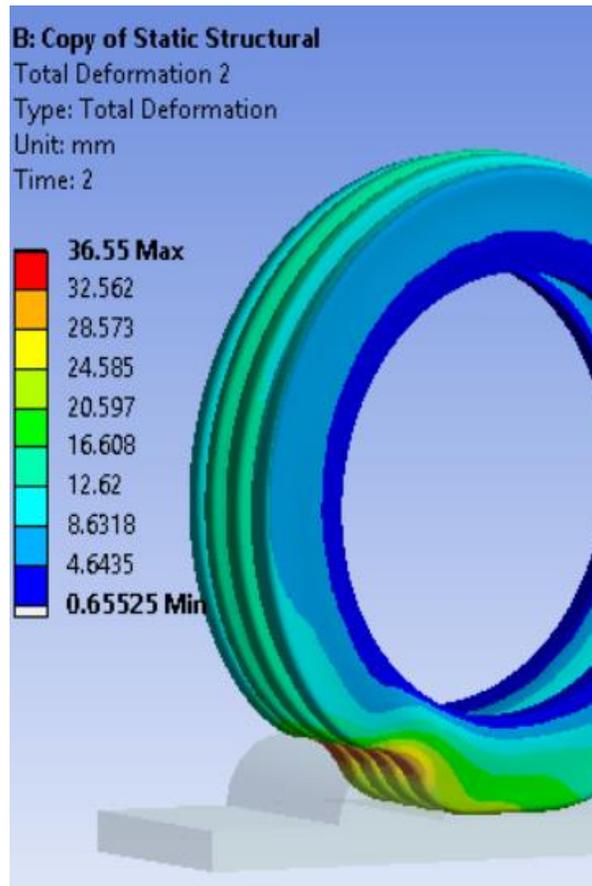
3D CAD model of rubber tire and road is created as shown in Figure. Hyper elastic rubber and concrete is used for tire and road, respectively. Non-linear frictional contact between tire and road with friction coefficient 0.5 under different load conditions such as inside tire pressure 0.12 MPa, vertical displacement 2 mm, horizontal displacement 50 mm and tangential force 500 N is applied.



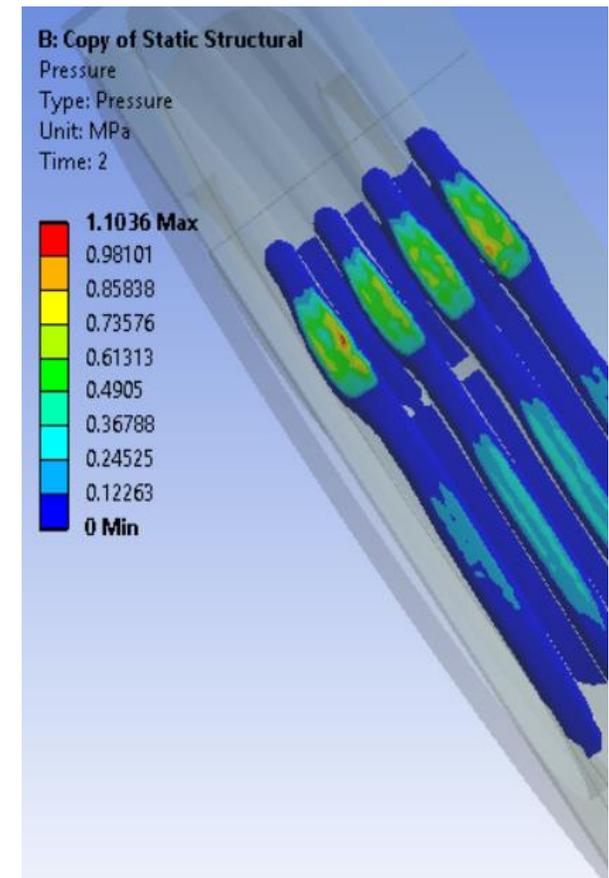
RESULTS



Stress Distribution



Total Deformation



Imprint Contact Pressure

From simulation results it has been observed that the von Mises stresses, deformation and contact pressure between tire and road are acceptable and within the limits of the ultimate strength.