



## The Contact Patch Analysis of Solid Tire on Drum Testing by Finite Element Method

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**Abstract.** The drum testing method is an effective method to study the tire rotating characteristic. The rolling resistance and contact force are carried out for the tire performance development. The tire was tested by the cylindrical drum indoor laboratory. Thus, the contact patch of rolling solid tire on drum surface should provide results as same as the tire testing on flat surface. This research developed the drum testing of solid tire model by finite element method to investigate the contact patch. The compressed contact patches of solid tire on drum were compared with the validated contact patches of solid tire on the flat surface. The different results showed the effect of the drum curvature. Consequently, the diameter of drum wheel was optimized for solid tire testing. This research found that the suitable ratio between drum diameter and solid tire diameter was 1.81.

**Keywords:** Solid Tire, Contact Patch, Drum Testing, Finite Element Method.