

进一步优化轮胎结构,提高轮胎性能。

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# Finite Element Analysis of Steady-state Rolling of Radial Tire

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**Abstract:** Using 11.00R20 radial tire as an example,a finite element model of steady-state rolling radial tire was established,considering the geometric nonlinear deformation of the tire and the large deformation in nonlinear contact between the tire and ground,as well as the tire and rim. The axial force distribution,contact pressure distribution and friction stress distribution were studied for the tire with standard pressure and load in the case of static loading and steady state rolling,and the rolling radius was obtained. The results showed that,at the same angular velocity,the absolute value of longitudinal friction force increased as the friction coefficient increased. As the angular velocity increased,the side friction force increased at first and then decreased. Under braking and traction state,the ground tire friction stress distribution was quite non-uniform,the high friction stress area was extended to the opposite direction of the movement direction under the braking condition,and the high friction stress area was extended to the movement direction under the traction condition.

**Key words:** radial tire;steady-state rolling;finite element analysis

## Carlstar 集团推出 Carlisle Trail Pro 轮胎

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美国《现代轮胎经销商》(www.moderntire-dealer.com)2015 年 8 月 13 日报道:

Carlstar 集团有限责任公司推出用于全地形车辆、运输车和农夫车的 Carlisle Trail Pro 轮胎(见图 1)。

公司称,Trail Pro 轮胎即使在混合地形下仍然能够提供平坦流畅的驾驶体验。无向自洁式的 Trail Pro 轮胎胎面花纹兼顾了前方及侧面良好的牵引性能与最适宜的制动性能,并提供了优异的胎面磨损性能和抗切割性能。有圆齿的胎肩还提供了抗刺扎保护并有助于排泥。

“实验室及实地测试表明,Trail Pro 轮胎像岩石一样坚固,在崎岖路面行驶时也能提供出众的驾驶品质。”动力户外产品市场拓展经理 Jennifer Weber 称。



图 1 Carlisle Trail Pro 轮胎

Trail Pro 轮胎的通用规格有:25×10-12 NHS,25×8-12 NHS,26×9-12 NHS,26×11-12 NHS,27×9-14 NHS,27×11-14 NHS. 12 英寸轮胎具有 4 层级坚固的胎体以提高耐久性能。结实的 14 英寸轮胎具有 6 层级结构以提高抗刺扎性能。

(马 晓摘译 许炳才校)