

Finite Element Analysis on Instantaneous Impact Performance of Aircraft Tire

LIU Xiao-ying, JIAO Zhi-wei, HE Xue-tao, YANG Wei-min

(Beijing University of Chemical Technology, Beijing 100029, China)

Abstract: A 3D finite element model of aircraft radial tire was established by using Abaqus software, and the equivalent stress of rubber and reinforcing material in the moment of landing was studied. The result showed that, the contact stress of rim flange was higher than that of the tread rubber at the aircraft touchdown instant, so the contact area between rim and tire was more prone to fatigue failure. The equivalent stress of belt was the highest in all of the reinforcing material, which became the main load-bearing part. The equivalent stress of cap belt was lower, and it mainly absorbed the tread impact. For the tread and belt, the peak value of equivalent stress appeared in the tire shoulder, and the stress in the center of ground contact area was low.

Key words: aircraft tire; instantaneous impact performance; finite element analysis

横滨新增超高性能轮胎产品线

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美国《现代轮胎经销商》(www.moderntire-dealer.com) 2014年7月1日报道:

横滨轮胎公司(YTC)新增一款全天候超高性能轮胎产品至 Advan 旗舰产品线。28个规格的 Advan Sports A/S 轮胎(见图1)于2014年7月1日在美国销售,年内还将推出其余的7个规格。



图1 Advan Sports A/S 轮胎

横滨营销和产品规划总监 Andrew Briggs 说:“Advan Sports A/S 轮胎具有动态全天候性能,我们将其设计为运动型豪华轿车轮胎,具有全天候超高性能。”

Sports A/S 轮胎现有规格为17~20英寸,

适用于奥迪、宝马、雷克萨斯、奔驰、英菲尼迪和保时捷等高性能汽车。

Andrew Briggs 称,驾驶者可体会到该轮胎在各种天气条件(干燥、雨天和小雪)下的优异操纵性、牵引力和平稳安静的驾驶舒适性。

Sports A/S 轮胎是 Advan 产品线提供的第1个在 W 和 Y 速度级别下 8 万 km 的胎面磨损里程保证的超高性能轮胎。

横滨公司表示, Sports A/S 轮胎具有先进的胎面胶,提供全天候优异的耐磨性能,先进的聚合物能使胎面在寒冷天气下保持柔软,同时胎面中额外添加的白炭黑提供优越的湿滑路面和冬季抓着力性能。

此外,3条直花纹沟排除胎面积水从而提高轮胎的潮湿和雪地牵引力,蛇形花纹沟提供较强的雪地剪切力。波浪形刀槽花纹提供额外的湿地操纵性能,Z形花纹沟提高雪地牵引力。

超大外部胎肩花纹块改善轮胎的干地性能,如更好的转弯性能,二合一大花纹块提高轮胎的刚度,从而提高侧向稳定性。

优化的接地印痕有助于均衡压力分布,使轮胎行驶里程延长,更耐磨。

(肖大玲摘译 吴淑华校)