

Application of Reinforcing Resin in All-steel Tire

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Abstract: The application of reinforcing resin resorcinol SL-R80/hexamethoxymethylmelamine resin (SL-R80/HMMM), resorcinol formaldehyde resin SL-3020LFR/HMMM, phenolic resin SL-2101/hexamethylene tetramine (SL-2101/HMT) and high styrene resin S-6-H, in all-steel tire were studied. The results showed that all four kinds of reinforcing resins had a delaying effect on the vulcanization of the compound. Among them, the t_{90} of SL-R80/HMMM compound was the longest, and that of SL-2101/HMT compound was the shortest. Compared with blank compound, the t_5 of the compound with S-6-H was extended, and the rest of the compounds was shortened. The flow property of the compound with SL-3020LFR/HMMM was poor, and the rest did not change. The four kinds of reinforcing resins could effectively improve the hardness of the compound, of which SL-R80/HMMM compound had the best improvement effect. The four kinds of reinforcing resins had little effect on the tensile strength and elongation at break of the compound, but they had a negative effect on the tear strength, of which SL-R80/HMMM had the greatest impact, and SL-3020LFR/HMMM had the least impact. Resin S-6-H had no effect on the heat build-up of the compound, while the other three kinds of reinforcing resins had negative effects, of which SL-3020LFR/HMMM had the greatest impact.

Key words: reinforcing resin; all-steel tire; curing characteristics; reinforcing; hardening; heat build-up; wear resistance

装配曙光院国产航空轮胎的

ARJ21飞机首飞成功

2020年11月23日11时50分,在山东东营胜利机场,伴随着ARJ21-700飞机有力的轰鸣声由远及近,ARJ21飞机平稳着陆,装配中国化工曙光橡胶工业研究设计院有限公司(简称曙光院)“三环”牌航空轮胎的ARJ21飞机历经4天试飞,各科目测试圆满成功。装配国产航空轮胎的ARJ21飞机首飞成功,标志着其国产化进程向前迈进了新的一步。

ARJ21飞机是我国首次按照国际标准研制的具有自主知识产权的中短程新型涡扇支线商用飞机,也是我国第1次完全自主设计并制造的支线飞机,是中国民航业“两干两支”战略的重要组成部分。目前,中国商用飞机有限责任公司已向客户交付ARJ21飞机39架,包括国航、南航等在内的ARJ21飞机航线运行客户已达7家,累计航线86条,通航城市64座。

航空轮胎是影响民航客机飞行安全的关键部件,其设计制造技术位于轮胎行业的金字塔顶端,全球只有屈指可数的企业可以研制并制造航空轮

胎。在此之前,ARJ21飞机一直装配国外航空轮胎,价格昂贵,受制于人。2020年9月16日,中国科学院白春礼院长将航空轮胎列入美国“卡脖子”任务清单。曙光院研发团队历经3年攻关,自主成功研制可在额定速度为 $378 \text{ km} \cdot \text{h}^{-1}$ 、超速着陆速度为 $418 \text{ km} \cdot \text{h}^{-1}$,以及多种苛刻工况下安全使用的高性能航空轮胎,其产品性能超越国外同类型航空轮胎,减小了飞机更换轮胎的频率,降低了航空公司的运营成本,成功突破ARJ21飞机轮胎“卡脖子”难题。

曙光院是上市公司中国化工吴华科技旗下子公司,50年来在航空轮胎设计、制造和检测方面积淀了雄厚的研发实力,掌握国内领先、国际一流的航空轮胎核心技术,擎起了“航空轮胎国家队”的旗帜,先后成功研制出多种型号民航航空轮胎。

“随着航空轮胎国产化的持续推进,未来将有越来越多的飞机装备国产高性能‘三环’航空轮胎翱翔蓝天!”在装配曙光院国产航空轮胎的ARJ21飞机首飞现场,曙光院院长王继泽如是说。

(中国化工曙光橡胶工业研究设计院有限公司 高香丽)