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Data Processing Method of Rubber Testing Based on Incompressible Large Deformation Analysis

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Abstract: In order to improve the accuracy of rubber constitutive relation, a new method based on incompressible large deformation analysis was presented for the data processing of rubber testing. Based on the uniaxial compression test data of rubber materials, the data were processed by GB/T 7757 method and the new method to get two rubber material constitutive relations, and the testing process was simulated by importing the two constitutive relations into ABAQUS finite element analysis software, respectively. The results showed that, compared to the test data, the error of the maximum axial deformation of test specimen calculated by the new method was only 20.4%, and lower than that by GB/T 7757 method, which was 34.7%. The accuracy of rubber constitutive relation could be significantly improved by using the incompressible large deformation method.

Key words: rubber; incompressible; large deformation; constitutive relation; finite element analysis

我国气门嘴芯行业进入微长时代

中图分类号: U463.345 文献标志码: D

2012 年我国气门嘴芯行业产量、销售收入及出口创汇等主要经济指标呈现小幅增长, 这是我国气门嘴芯行业连续两年微长, 标志着我国气门嘴芯行业在经历十几年高速增长后进入微长时代。

中国化工装备协会气门嘴芯专业委员会对我国 13 家主要气门嘴芯企业统计显示: 2012 年气门嘴芯销售收入 15.85 亿元, 同比增长 1.0%; 气门嘴产量 14 亿套, 同比增长 1.5%; 气门芯产量 22.6 亿支, 同比增长 1.4%; 出口交货值 6.87 亿元, 同比增长 0.1%。

据介绍, 2012 年我国气门嘴芯行业表现出 4 个明显特点。①内销比例增大。由于世界汽车行

业不景气, 同时欧美强制性推广汽车轮胎气压监测系统, 导致气门嘴芯出口需求减少, 企业不得不加大内销力度。②气门嘴芯企业大力拓展非气门嘴芯领域业务。在气门嘴芯微长时代, 气门嘴芯企业利用自身特点将产品向汽车配件延伸。③我国汽车轮胎气压监测系统产业发展迅速, 自主研发的气压监测系统产品具有静态和高速可靠接收、即时反应、低功耗、长寿命等特点, 达到了国际先进水平。实现其产业化将大大提高我国气门嘴芯的科技含量和水平。④我国气门嘴芯行业自动化程度快速提高。近年来劳动力成本大幅增加, 汽车行业对气门嘴芯稳定性要求提高, 气门嘴芯企业不得不加大技术改造力度, 提高自动化水平。

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