

Tire Science and Technology ,1976 ,4 (2) :86~114

2 庄继德. 汽车轮胎学. 北京:北京理工大学出版社, 1996. 273~320

3 Potts G R,Bell C T,Roy T K. Tire vibrations. Tire Science and Technology ,1977 ,5 (4) :203~225

4 Yamazaki ,Akasaka. Twisting stiffness and lateral vibration of a radial tire sidewall. Tire Science and Technology , 1988 ,16 (4) :223~248

5 Christensen R M. Mechanics of composite materials.JOHN WILEY & SONS ,New York ,1990. 80~84

6 Ekval J C. Structural behavior of monofilament composites. Proc. AIAA 6th Structures Conf. , AIAA , New York ,April ,1965. 121~127

7 琼斯 R M. 复合材料力学. 上海:上海科学技术出版社, 1981. 29~35

收稿日期 1997-03-25

Prediction of Elastic Constant of Radial Tire Belt

Zhu Xingyuan , Xie Zhimin , Yan Xiangqiao and Du Xingwen
(Haerbin Institute of Technology 150001)

Abstract The equivalent elastic constant of the tire belt could be predicted by using the basic properties of the materials in tire compound through simplifying the tire belt to a cylinder which was composed of multi-layer tubes with different material properties and assuming that the strain in the belt plies was continuous and coupleless. The predicted value was in accordance with the test result.

Keywords tire ,belt ,composite ,elastic constant

1996 年世界 11 大橡胶公司的一些统计数据

项 目	米其林	普利司通	固特异	大陆	住友	倍耐力	横滨	东洋	库珀	锦湖	韩国
销售额/ 亿美元											
总计	139. 4	179. 9	131. 1	69. 5	53. 5	66. 4	37. 0	24. 2	16. 2	15. 17	12. 67
轮胎	131. 0	129. 0	117. 1	46. 75	40. 0	31. 45	26. 0	13. 78	13. 72	13. 55	11. 35
净利润											
总计/ 亿美元	6. 09	6. 46	1. 02	1. 28	0. 43	3. 0	0. 35	0. 1	1. 08	0. 08	0. 13
占总销售额比例/ %	4. 4	3. 6	0. 8	1. 9	0. 8	4. 5	0. 9	0. 4	6. 7	0. 5	1. 0
员工数量/ 人	119 780	92 458	91 310	44 767	24 000	36 534	12 267	8 083	8 932	6 252	6 403
轮胎厂(包括合资厂)											
厂家数/ 个	59	41	49	19	16	18	11	6	5	4	5
所在国家数/ 个	18	19	30	13	7	11	5	3	2	2	2
轮胎年产量/ 亿条	1. 710	1. 690	1. 786	0. 761	0. 615	0. 480	0. 210	不详	0. 370	不详	不详
基建投资											
总额/ 亿美元	8. 02	11. 69	6. 18	3. 68	4. 23	3. 51	不详	1. 61	1. 94	不详	0. 55
占总销售额比例/ %	5. 8	6. 5	4. 7	5. 3	7. 9	5. 3	不详	6. 7	12. 0	不详	4. 3
科研经费											
总额/ 亿美元	6. 97	3. 36	3. 75	2. 78	1. 61	2. 04	1. 23	0. 76	0. 20	0. 46	0. 55
占总销售额比例/ %	5. 0	1. 9	2. 9	4. 0	3. 0	3. 1	3. 3	3. 1	1. 2	3. 0	4. 3

(相 泰摘自美国《轮胎商报》,1997-09-01 ,P11 及
日本《轮胎月刊》,1997-09-10 ,P13)