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Research on Compression and Rebounding of the Zoom Air in Sport-Shoes

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Abstract Today, the zoom air was widely used in top grade sport-shoes. Firstly, the function of zoom air, including shock absorption, energy return, light quantization and ornament results were introduced. Secondly, the problem of using the zoom air nowadays was brought forward, through testing the compression and rebounding of the zoom air in sport-shoes, the shock absorption and the energy return of it were researched. The factors of influencing the compression and rebounding of the zoom air were discussed from speed of the athletics and the aging of the zoom air. The speed had effect on the shock absorption performance and energy return performance. The faster the speed was, the smaller the protection the zoom air could offer and the energy feedback were. Ageing would not make the material of the zoom air produce essential change, but may cause the reduction of the gas in the zoom air. All performances of the zoom air were improved after ageing, which means the zoom air in the market was not optimum at present, all this contributed to the lack of united standard. Finally, the method of testing and the standard of evaluation were put forward, which did some early work for the standard of zoom air in producing and testing.

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First page example



Research on Compression and Rebounding of the Zoom Air in Sport-Shoes^{*}

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Key words: sport-shoe; zoom air; compression and rebounding; shock absorption; energy return

Abstract. Today, the zoom air was widely used in top grade sport-shoes. Firstly, the function of zoom air, including shock absorption, energy return, light quantization and ornament results were introduced. Secondly, the problem of using the zoom air nowadays was brought forward, through testing the compression and rebounding of the zoom air in sport-shoes, the shock absorption and the energy return of it were researched. The factors of influencing the compression and rebounding of the zoom air were discussed from speed of the athletics and the aging of the zoom air. The speed had effect on the shock absorption performance and energy return performance. The faster the speed was, the smaller the protection the zoom air could offer and the energy feedback were. Ageing would not make the material of the zoom air produce essential change, but may cause the reduction of the gas in the zoom air. All performances of the zoom air were improved after ageing, which means the zoom air in the market was not optimum at present, all this contributed to the lack of united standard. Finally, the method of testing and the standard of evaluation were put forward, which did some early work for the standard of zoom air in producing and testing.

Introduction

In China, the zoom air is fresh. There weren't the relevant standards about the zoom air and the inspection of it [1]. Abroad, the research about the zoom air was kept as "trade secret", which discouraged the dissemination of the standard about the zoom air. But the application of the zoom air was more and more extensive at present, so need unified standards to standardize the trade of zoom air, which made the protection function of the air cushion realized [2]. Some work in the earlier stage of the standard about zoom air had been done in this thesis by testing the compression and rebounding of it, seeking the shock absorption and the energy return how to be influenced by the speed of the athletics and the aging of the zoom air.

Functions of the Zoom Air

Function of Shock Absorption. The definition of the shock absorption of the zoom air in sport-shoes made by the ASTM (American Society for Testing Materials) was: by means of the growth of time which external forced works on the zoom air, made the energy of the peak value of shock power reduced. The bump time last longer, the zoom air deformed greater, the better the shock absorption function was. Shock absorption function was primary performance of a zoom air. Among the sport, by pressing the shape of the zoom air the gas of zoom air was pinched, it made the shock power that the human body received in sports reduced to produce certain obstruction, thus shielded the human body.

Function of Energy Return. Energy return was the procedure that some of the energy was feed backed to body in the course of sport. The zoom air absorbed some energy when produced obstruction in the course of pushing. Once the pressure was dismissed from, the zoom air would release this part

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