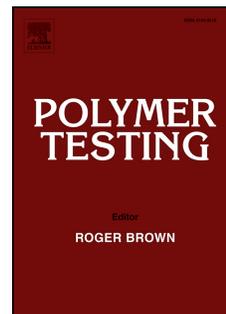


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Influences on long-term behaviour of elastomer chassis bushings considering their geometric design and rubber compounds

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Elastomer bushings are used in vehicle chassis application to contribute to self-steering effects and vehicle handling behaviour within the limits of elasto-kinematic design of vehicle suspensions. Moreover, they have been more and more frequently adopted to improve the ride comfort as well. A known issue with elastomer bushings is that their properties, like stiffness and damping characteristics, may change considerably over operational lifetime due to numerous influences, and may show adverse effects compared with their initial design configuration.

The present study addresses the relationships that are responsible for the change of the static and dynamic behaviour of rubber bushings in the course of time, and as a matter of diverse (thermal, chemical and geometrical) influences. To achieve a preferred and robust design of the suspension system, regarding the selection of the appropriate design and rubber compounds of convenient bushings, and in this way to restrain their limits of tolerance, the properties of both the components and their rubber compounds are analysed. Based on comprehensive experimental test results of the full component and of the rubber compounds, a design concept for an elastomer chassis bushing is proposed, that aims to better preserve its functional properties with respect to time, high temperatures and operational loads.

Elastomer bushing; vehicle dynamics; thermal load; mechanical load; robust design

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