

## Experimental and Numerical Study on Energy Absorption Characteristic of a Coupler Rubber Buffer Used in Rail Vehicles

**Authors :** Zhixiang Li, Shuguang Yao, Wen Ma

**Abstract :** Coupler rubber buffer has been widely applied on the high-speed trains and the main function of the rubber buffer is dissipating the impact energy between vehicles. The rubber buffer consists of two groups of rubbers, which are both pre-compressed and then installed into the frame body. This work focuses on the energy absorption capacity of each group of buffers particularly. The quasi-static compression tests were carried out to obtain the pre-compression force and the load-deflection response of the buffers. Then a finite element (FE) model was constructed using Ls\_dyna program. The rubber material was modeled with a tabulated method easily, in which no more material constants need to be fitted. The simulation results agreed with the experimental results well. Numerical study of the buffers was performed using the validated FE model and the influence of the initial pressure on the buffers was obtained. In addition, the interaction between the two groups of buffers was also investigated and the optimum distribution of the two was found.

**Keywords :** initial pressure, rubber buffer, simulation, tabulated method

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