

Method to Evaluate the Acoustic Performance of the Pillar Filler Foam in a Truck Cab

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The truck cab is made of many structural members like hinge, A / B / C - pillar, rocker, roof rails, headliner, quarter panels, cross-members at the floor and other body panels. For an acoustic example, the source energy travels easily from one end to another end through pillars. To reduce these acoustic effects, the filler foams were added inside the pillars. The proper usage of filler design and filler material type produces the optimal sound response at the driver head space location.

In this paper, an analytical method is used to evaluate the acoustic performance of the fillers as described above and the method also avoids the expensive full vehicle tests. The statistical energy analysis (SEA) model simulations and post-processing techniques were used to evaluate the results quickly with an acceptable level of accuracy.

It has proven that the effect of the foam thickness and foam coverage area of the fillers can be evaluated and helped to achieve the optimal sound response at the driver head location.