

## Case Study:

### Weight and Cost Reduction without Compromising Performance 3M™ Thinsulate™ Acoustic Insulation

#### Results at a glance

- **Overall number of parts reduced.**
- **Overall part footprint reduced while achieving same acoustic performance.**
- **Waste stream eliminated by using ultrasonic welding as the attachment process.**
- **Significant mass savings when comparing area to area.**  
(For this application, >40% mass reduction was achieved.)\*



#### The Customer

Road and tire noises often travel through the luggage area of a vehicle making the area ideal for acoustic treatment. While the existing vehicle treatment performed satisfactorily, the treatment was also heavy, complex and cumbersome. When asked to help simplify the luggage area acoustic package, 3M engineers suggested 3M™ Thinsulate™ Acoustic Insulation.

#### The Challenge

The existing acoustic package consisted of ten nonwoven absorber parts (five per side), that were hand fitted to the trim panels at the Tier using a pressure sensitive adhesive with release liner. The challenge given to 3M was to provide a solution with a significant system cost reduction without compromising acoustic performance.

#### The Solution

The flexibility of Thinsulate Acoustic Insulation from 3M allowed a single part solution to be developed for each side, considerably simplifying both the number of components and the installation from 10 parts down to 4. At the same time, it was noted that the pressure sensitive adhesive and waste stream from the release liner could both be eliminated by attaching the part with ultrasonic welding. Acoustic testing showed that replacing the incumbent with Thinsulate Acoustic Insulation provided a significant improvement in performance. After consulting with the OEM engineers, it was deemed the new performance, 40% lighter weight than the original insulation, was beyond the performance needed in the application, but it also provided an opportunity to reduce the overall part footprint, thus further reducing cost and weight.

#### The Results

The final single part design delivered equivalent acoustic performance to the five part system, but with significant cost reduction, weight reduction, assembly simplification and elimination of a waste stream.

\*Results may not be typical.

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