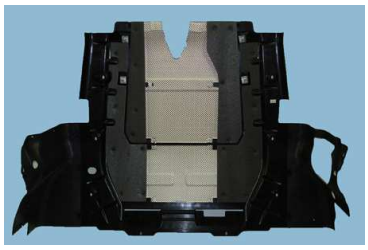
Perforated flat absorbers for efficient noise minimization

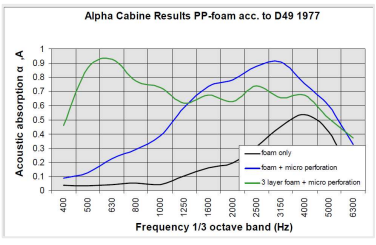
Space-saving acoustic solutions by Sekisui Alveo for automotive applications

Lucerne, May 31, 2011 – Noise emissions are an important issue for automobile manufacturers: On one hand, they are legally required to comply with low limit values, and on the other, acoustic insulation increases the comfort of vehicle occupants, and thus serves as a sales argument. When choosing an absorber system, outstanding insulating and mechanical material properties play a decisive role for the manufacturers, but increasingly often so does available space. Sekisui Alveo, manufacturer of polyolefin foams, has optimized the acoustic properties of its products through modification and special treatment. The new flat absorber made of micro-perforated Alveocel foam efficiently reduces noise emissions in the engine compartment and meets the need of the automobile industry for space-saving solutions.



Flat absorbers made of micro-perforated Alveocel polyolefin foam by Sekisui Alveo require very little space in cramped engine compartments.

Already for years, Sekisui Alveo has been closely collaborating with systems suppliers to develop various efficient box absorber solutions. Due to the thermal requirements, only highly resistant PP foams come into question for applications in the engine compartment – foams that possess extended temperature resistance of over 140°C. With its new foam Alveocel, the company has now developed an especially space-saving variant: a flat absorber made of micro-perforated foam.



Black line:
Foam alone has a relatively low absorption effect.
Blue line:
Single layer micro-perforated foam achieves good values.
Green line:
multi-layer micro-perforated foam achieves optimal performance across a broad frequency range.

Perforation instead of thermoforming. The Alveocel foam is needled in a specific pattern and thereby is given its acoustical function. The acoustic waves penetrate the partially open cells after perforation. There they are on one hand transformed into

kinetic energy (Helmholtz resonance effect), and on the other into heat energy by friction (dissipation). Through the combination of the two effects, the flat absorber covers a wide frequency range. Even a single-layer micro-perforated absorber efficiently reduces noise emissions from the engine compartment. The absorptive effect is increased by the use of several foam layers.

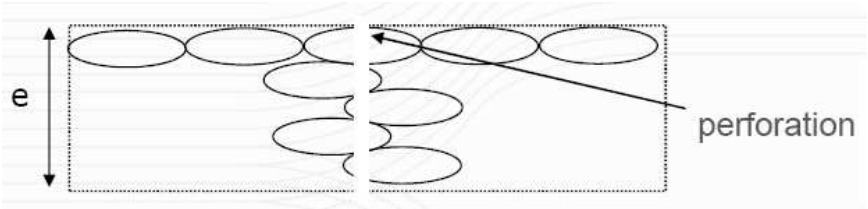
Text length:

1,917 keystrokes (including spaces)

INFOBOX: *Helmholtz resonance effect and dissipation*

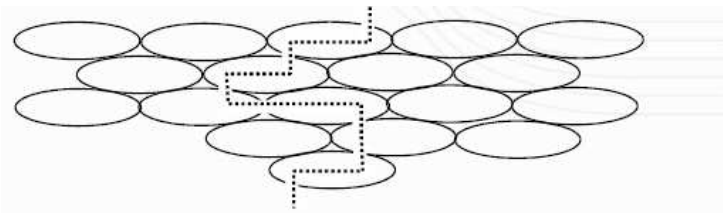
Helmholtz resonance effect and Alveocel:

The acoustic waves penetrate the foam cells through the small openings created by perforation. The air contained in the foam cells absorbs the energy of the acoustic waves like a damper – a swinging mass – and converts it into kinetic energy. The walls of the foam cells are set into oscillation by the kinetic energy; the movement is transmitted to adjacent cells so that ultimately the entire material oscillates. In this way a high rate of absorption in the low frequency range is achieved.



Dissipation and Alveocel:

The acoustic energy is converted into heat by the friction of the air molecules in the absorber system, here in the perforated – and thereby partially open-cell and interlinked – foam cells. Through dissipation a high rate of absorption in the middle and upper frequency range is achieved.



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849 keystrokes (including spaces)

Sekisui Alveo AG company profile

Sekisui Alveo AG with head office in Lucerne, Switzerland, develops and produces extruded and cross-linked polyolefin foams, which are used in: Adhesive Coating, Automotive, Construction including Artificial Turf as well as Industrial and Consumer Goods. The solutions are developed in close cooperation with processing companies and manufacturers, and tested and approved in the company's Application Services Laboratory.
Sekisui Alveo was established in 1971 and today employs 500 people in 12 countries. Beside the head office in Lucerne and the three production plants in Roermond (Netherlands), Bad Sobernheim (Germany) and Merthyr Tydfil (UK) the company has local offices throughout Europe and in South America. Sekisui Alveo is owned by Sekisui Chemical Co. Ltd.

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