



Materials and Coatings

Recessed Core Composite Panel Design

Low noise radiation and increased sound power transmission loss

NASA's Langley Research Center has developed an enhanced design for a composite panel with a recessed core. NASA designed it to decrease the radiation efficiency and increase the transmission loss while maintaining load-bearing capability so that it could be used in applications such as aircraft floors. Similar to traditional composite panels, the innovation possesses low weight characteristics, but in addition, the NASA design can be used in load-bearing applications. The invention was developed for NASA's Quiet Aircraft Technology Program. The superior design of the composite panel can be used in a wide variety of commercial applications wherever honeycomb is needed and improved acoustics is desired. NASA has patented and tested the novel design, and is interested in attracting development partners and potential licensees for the recessed core composite panel design.

BENEFITS

- ➔ Good strength
- ➔ Load-carrying application
- ➔ Low weight characteristics
- ➔ Low noise radiation

APPLICATIONS

- ➔ Aerospace - internal aircraft structures such as partitions (nonload bearing) and floors (load bearing).
- ➔ Architectural - churches, offices, studios, cinemas, theaters, elevators
- ➔ Marine - naval vessel partitions, especially around engine compartments
- ➔ Enclosures - cleanrooms, machine enclosures, plant offices, modular shelters, and broadcast studios

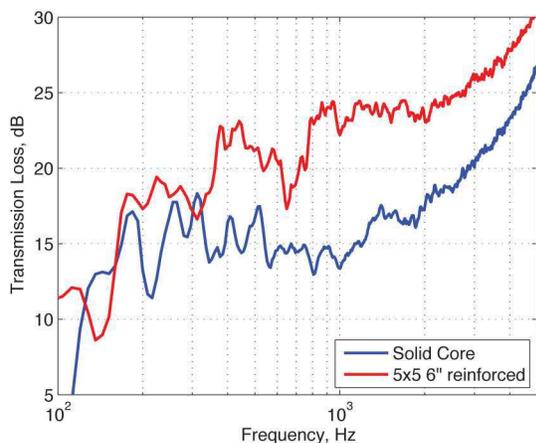
technology solution



THE TECHNOLOGY

NASA Langley developed the novel method of constructing recessed core composite panels to reduce unacceptable noise radiated by the existing composite panels. Composite panels are widely used in aerospace applications, and like most lightweight, stiff materials, they efficiently radiate sound resulting in high noise levels in an enclosed area. Conventional noise treatments add weight to a vehicle, which negates some of the benefits of using composite panels.

The innovation is a variation on a voided core for reduced sound radiation in composite panels. A voided core is made by removing the core material in select areas. This creates a double wall cavity, which increases transmission loss but weakens the panel. In the recessed core, only a portion of the honeycomb is removed through the thickness. Both of these methods decrease wave speed by reducing the stiffness in portions of the panels. The lost stiffness is recovered by reinforcing the recesses with thin plates, in effect creating interior facesheets. The reinforced recessed core improves transmission loss over the solid core design yet maintains panel strength. Optimization of the recess layout is possible for a particular application.



Comparison of the reinforced recessed core to the solid core



Composite panel three-quarters complete

PUBLICATIONS

Patent No: 8,087,494

National Aeronautics and Space Administration

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