

We have one goal — improving the noise and vibration quality of our customers' products. Roush delivers innovative, effective noise and vibration control solutions. By combining advanced analysis capabilities, comprehensive engineering services, and state-of-the-art facilities, Roush has become a proven partner in identifying and resolving challenging noise and vibration issues. Backed by the diverse capabilities of the Roush family of companies, we are uniquely equipped to provide turnkey noise and vibration solutions.

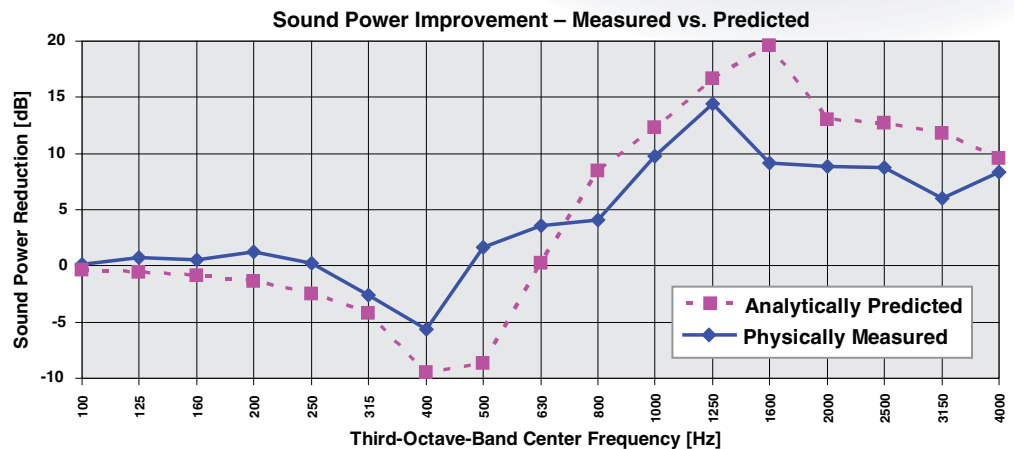
Design of Sound Attenuation Treatments for Engine Covers

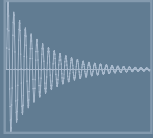
Roush is a leader in the design of noise reduction treatments for engine covers. The combined use of analytical tools for prediction and physical test methods for confirmation and further development has produced successful sound attenuation treatment designs that have gone into production on various engine covers.

Roush has developed unique finite element and boundary element analysis procedures in ABAQUS/Standard and SYSNOISE that can reliably predict the noise reduction performance of damping and isolation treatments for engine covers. Our analysis advantage is access to an in-house database of thousands of viscoelastic materials that are used in engine cover noise reduction treatments.

The NVH Materials Laboratory at Roush maintains a database of material properties obtained through physical testing. The shear storage modulus and loss factor with respect to frequency and temperature are measured for each viscoelastic material tested, along with mass density and other characteristics. Roush has been able to successfully and directly integrate these material data into its analytical models. There is no guessing about viscoelastic material properties at Roush.

For one example, consider a noise reduction treatment that was designed for an engine cover. This was an isolation concept with a full outer cover attached to the existing cover with a viscoelastic material at various locations. The noise reduction treatment was analytically predicted to significantly reduce the overall sound power level. The analytical results were confirmed using a physical shaker test of the treated engine cover.





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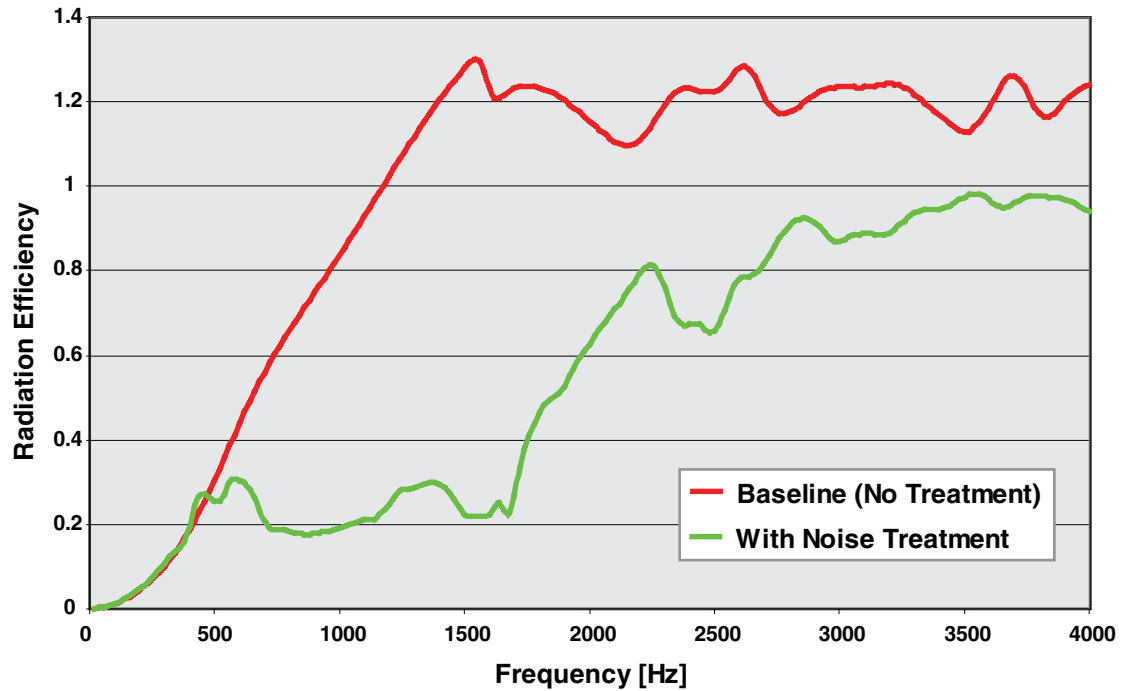
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RIDOS-3/07

Simulated Radiation Efficiency vs. Frequency for the Engine Cover



Simulated Sound Power vs. Frequency for the Engine Cover

