

DEVELOPMENT OF A MAGNETIC SUSPENSION SYSTEM FOR RELIABLE VIBRATION DAMPING MEASUREMENT

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ABSTRACT

The damping properties of viscoelastic polymeric materials, as measured by different organizations and test techniques, often differ considerably. Sources for the discrepancy include parasitic energy dissipation at clamped supports of sandwich beam configurations, as well as imperfect simulation of a perfect clamped end condition. This uncertainty can be eliminated by magnetically suspending the test beam in a free configuration, without mechanical contact for pickup or excitation.

This paper will describe an approach to develop a proof-of-principle magnetic suspension system to levitate a typical test beam. The magnetic suspension system consists of an attraction electromagnet whose stiffness is controlled by closed loop feedback system.

Controllable stiffness of magnetic suspension will help eliminate measurement discrepancies attributable to the use of different fixtures by different organizations to clamp sandwich beams.

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