

NASA TECH BRIEF

John F. Kennedy Space Center



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Control of Elasticity in Cast Elastomeric Shock/Vibration Isolators

The problem:

Elasticity in cast elastomeric shock/vibration isolators (see Figure 1) is determined by their physical dimensions and by the type of elastomer used. Once the elastomer is selected and cast between the two concentric tubes of the device, the isolator elasticity will remain fixed. There is no effective way to produce isolators to different elasticity requirements without changing their dimensions or using different elastomers.

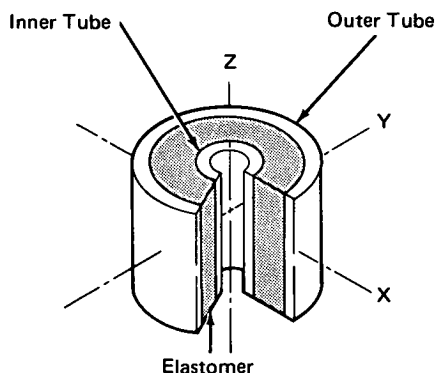


Figure 1. Standard Isolator Shock/Vibration

The solution:

Isolators having the same dimensions can be built to different elasticity requirements using the same elastomer.

How it's done:

Two approaches may be used. In the first, the elastomer is poured between the two concentric tubes to height h_1 as shown in Figure 2. Next, a low-temperature melting point material such as wax is poured to height h_2 . After the wax hardens, more elastomer is added. When the elastomer has set, two small-diameter holes are drilled in the isolator outer wall at the wax layer level. The wall then is heated and the molten wax is poured out, leaving a void. The size of this void may be varied, depending on the elasticity desired.

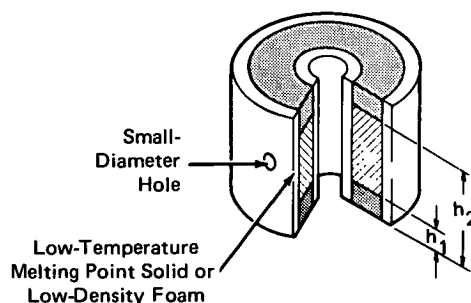


Figure 2. Improved Shock/Vibration Isolator

The second method is very similar. Instead of wax, a cylindrical spacer of low-density foam such as polyurethane is inserted. When more elastomer is added to complete the mount, the foam then effectively acts as a void. Again the size of this spacer may be varied to meet different elasticity requirements.

Note:

Requests for further information may be directed to:
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Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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