

# NASA TECH BRIEF



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## Study Made to Control Depth of Potting Compound for Honeycomb Sandwich Fasteners

### The problem:

To embed fasteners (inserts) in thin walled honeycomb sandwich structures and obtain maximum tensile strength of the fastener units while keeping added weight to a minimum. Large honeycomb sandwich panels used in aerospace structures such as the OAO and Surveyor Nose Fairings, must have provisions for the attachment of separation mechanisms, bulkheads, electrical harnesses, etc. The potted fastener is especially useful, since it has high strength and can be installed with access to only one face of the panel.

### The solution:

A study was conducted to determine optimum fastener insert size and shape, type of embedding cement, diameter, undercut and depth of recess in the honeycomb structure for maximum tensile strength.

### How it's done:

In the tests that were run, fasteners were molded into 4×8×1.75-inch thick sections of glass-fabric-reinforced phenolic sandwich structures. It was significant to note that 75% of the failures occurred regardless of the depth of the potting compound. Fastener inserts having thread sizes of 10-32 and ¼-28 were used and the depth of potting varied from ¼ inch below the base of the insert to 1¼ inches, the full depth of the panel. In those instances where the core undercut and depth was less than the panel

thickness, the potting compound was confined by inserting a disk of fiberglass cloth on the base of the undercut. The best potting compound was found to be 5:5:1 weight mixture of a commercially available epoxy resin and curing agent, and ¼ inch long milled glass fibers. Test loads were applied through threaded rods at a rate of 0.2 in/min.

### Notes:

1. In cases where several hundred inserts are used, considerable cost and weight savings can be realized by preventing the potting compound from running the full depth of the core by using the fiberglass plug. Inexpensive tests as described above will readily determine the optimum depth of potting.
2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
Lewis Research Center  
21000 Brookpark Road  
Cleveland, Ohio 44135  
Reference: B66-10677

### Patent status:

No patent action is contemplated by NASA.

Source: J. Cushman  
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