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Locating and Sealing Air Leaks in Multiroomed Buildings

The problem:

A corrugated-siding building had been constructed to house a variety of "clean rooms" and radioactive assembly areas. The clean rooms required positive air pressure to exclude contaminants, while the radioactive rooms required negative pressure to retain contaminants. Air leaks from room-to-room, and from the rooms to the building exterior were excessively high. A need existed to isolate and repair the leaks.

The solution:

Use industrial, nontoxic smoke bombs to locate the leaks, and fill the discovered leak areas with polyurethane foam.

How it's done:

To locate major leaks in a room, seal all the obvious air escape routes, including exhaust registers. Utilizing the heating/ventilating and air conditioning system, the room is then pressurized to a minimum of 0.1 inch water (0.2 mm Hg) above the pressure of adjoining rooms. One smoke bomb is placed for every 50 square feet of floor space (equal distribution) and ignited. Escaping smoke in walls and ceilings is readily detected.

To locate minor leaks in pipe and duct pass-throughs, use the above method, except that a single smoke bomb is held within 1 or 2 feet of the suspected area.

Once detected, the leaks can be closed by filling the wall and ceiling construction joints with commercial polyurethane foam. Various practical methods have been developed to hold the foam in place, while setting.

Notes:

1. This technique is reliable, economical, and relatively quick.
2. White smoke bombs allow for maximum visibility with minimum residue deposit; yellow smoke bombs burn without residue and permit ideal photography.
3. Inquiries concerning this method may be directed to:

Technology Utilization Officer
AEC-NASA Space Nuclear
Propulsion Office
U.S. Atomic Energy Commission
Washington, D.C. 20545
Reference: B68-10024

Patent status:

No patent action is contemplated by AEC or NASA.

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