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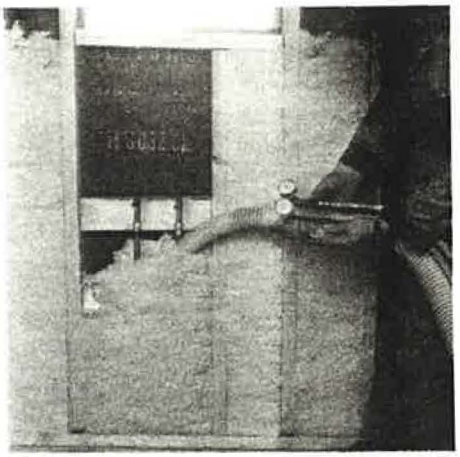
Cellulose Insulation (1):
Blown-In-Blanket insulation: How airtight is it?

The Blown-In-Blanket (BIBS) is a patented insulation system that has gained popularity in the building industry in the USA during recent years. BIBS combines standard loose insulation materials (fibreglass, rockwool, or cellulose) with a latex adhesive binder. It allows builders to install a custom-fit insulation job that reduces that gaps and void areas found when using other insulating methods.



But are the site installed loosefill insulation products really better than factory produced products (like batts or boards) that have uniform quality control? Obviously, each manufacturer promotes his product over all others.

Recent research tests supervised by the NAHB National Research Center (USA) looked at wall systems insulated with pre-made factory batts and BIB insulation systems. The results show that the blown-in-blanket systems are up to 3 times more airtight than identical wall systems insulated with factory made batts.

The tests were conducted on five full-scale wall sections using two insulation methods: one with standard factory made fibreglass batts and the other with the BIB System.

Because of the binder addition, the BIBs batt does not shift or settle, should last the lifetime of the structure, and is absent of costly voids. (The Manville Corp. has reported that a 4% void area in R-19 insulation coverage can lead up to a 50% heat loss.) With a properly installed BIB this problem is eliminated.

The tests compared both 5½" and 3½" wall systems following standard test procedures (ASTM E283 "Rate of Air Leakage"). This involves mounting the walls into a test chamber where a fan-induced pressure difference across the wall can be accurately measured. The effective leakage of each of the walls was assessed by measuring the air flow rate under different test pressures.

The standard conditions for air leakage tests is at a pressure difference of 50 Pascals (0.20 inches of water). This corresponds to a constant 20 mile-per-hour wind acting on the wall. In both the 5½" and 3½" walls, the conventional batt insulated walls had about three times more air infiltration than the BIBs walls.

This standard reporting condition illustrates a constant pressure difference not typically seen in a residential environment. However, it provides a good comparison of the relative leakage of the walls.

The 3½" test wall using R-11 batt installed to manufacturers instructions allowed 6.3 cubic feet per minute (cfm) of infiltration, versus 2.7 cfm for the 3½" BIBs wall.

The 5½" test wall with R-19 fibreglass batt passed 7.3 cfm while the 5½" BIBs wall passed 2.2 cfm.

But does this really mean something significant? It is important to keep in mind that though air infiltration may account for as much as 50% or more of a building's heating and cooling loads, the actual amount of air leakage through the wall may be very small. The main paths for air leakage are around window and door frames, electrical outlets, top and bottom plates, poorly fitting and loose construction, and through damage in finished building materials. Other studies by the NAHB Research Center have shown that in controlled laboratory tests, the total wall leakage through electrical outlets may be as much as 30%.

These data do show, however, that the infiltration component through the walls may be reduced by use of either of the materials and wet mix adhesive as applied in the BIBs technique. There may also be significant acoustical performance variations between the two wall insulation systems. The effect of damage to sheathing or other materials may also contribute to higher amounts of through-the-wall leakage.

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