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Cellulose and Airtightness – More Surprises

The following case study should be quite interesting to anyone looking for evidence that cellulose fiber insulation contributes significantly to building airtightness.

A recently completed house in the Edmonton area was built with 2x6 walls insulated with cellulose-fiber insulation. The walls had a 10-mil polyethylene vapor barrier that was sealed at all seams and penetrations. Horizontal strapping was installed on the inner surface of the studs and the cellulose was blown in from the outside through holes in the plywood sheathing before the drywall was installed.

The house was pressure tested for air leakage and was found to be very tight --1.1 air changes per hour at 50 pascals pressure.

As an experiment, the building designers, Howell Mayhew Engineers, slit the polyethylene air/vapor barrier in about 20 places and then retested the building for airtightness. There was absolutely no change in measured air leakage after the air/vapor barrier was slit. Furthermore, smoke pencil testing at the slits showed "not a breath" of air leakage. The cellulose, installed at a high density was maintaining the building's airtightness. (No attempt was made to tighten the exterior sheathing and the siding had not yet been installed when the test was performed.)

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