Airtightness of Joints in Wall Sheathing as a Function of Lumber Drying and Attachment

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ABSTRACT

Lumber shrinks as it dries, and connections loosen because of "nail popping." Airtightness tests of 30 full-sized walls (8 feet by 10 feet) are reported. Leakage development through joints in waferboard and other sheathing materials was studied when the framing material dried out from relatively high moisture content levels. The data show the correlation between lumber shrinkage and the air leakage characteristics of joints. The influence of nail spacing was also studied. Typical joints studied include butt joints in sheathing at wall studs, joints in sheathing at wall plates, and several wall-to-floor connection details. This work provides insights into the airtightness performance of exterior envelopes of wood-frame construction and provides order-of-magnitude leakage characteristics to allow simulation of the drying out of walls using recently developed computer models.

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