

Keeping It Tight

Production builders are keeping air infiltration to a minimum with careful planning and plenty of caulk.

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Cutting the air exchange rate from 0.50 to 0.25 air changes per hour will typically produce the same range of savings as doubling wall R-values from R-20 to R-40 and can be done for much less money. Dollars put toward caulking and sealing is money well spent. Builders, snooping around with smoke pencils, have identified a number of trouble spots in new construction—some obvious, some not.

The building shell

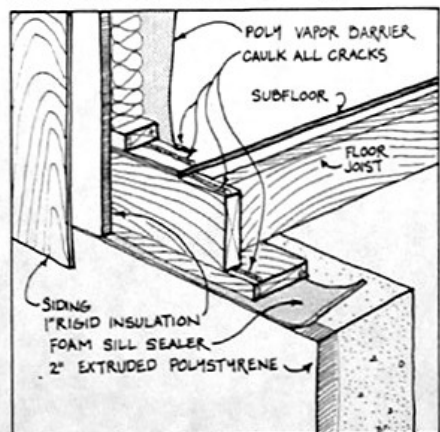
Energy-conscious builders establish their first line of defense while roughing the shell. Begin at the beginning with an inexpensive fiberglass or foam sill sealer compressed between the sill and the foundation wall. This is a tricky area to caulk later so get it right the first time, doubling the sealer where necessary to fill larger gaps. As the band joists are layed up, add a bead of caulk between joist and sill. Follow with caulk between subfloor and band joist and between the subfloor and bottom plates of the outside walls. This glued-up assembly will help prevent air from flowing under exterior walls or between basement and outdoors. If insulating sheathing is used, butt and seal rigid wall insulation to exterior foundation insulation where they meet at the sill. If possible, keep wall and foundation insulation flush on the exterior so the siding can be carried right over the joint with no flashing. This makes for tight, neat, and easy exterior detailing.

In a two-story structure, caulk around the second level band joist the same as the first. Caulk upper top plate to band joist, band joist to subfloor, and subfloor to the bottom plate of the second-story wall.

Building corners tend to be leaky and underinsulated. They deserve special attention. As in other exterior joints that coincide with breaks in the interior finish, caulking is helpful here. Seal either sheathing to sheathing or sheathing to framing. If insulating sheathing is used, run a length of tape up the corner.

If a permeable sheathing is used, the entire building, from sill to top plate, may be wrap-

ped and taped with an air and water barrier that "breathes" such as DuPont's Tyvek® or Parsec's Airtight White™. If these materials are fully taped at seams and door and window openings, they could eliminate the need for much of the exterior caulking.



Kansas Builder, Craig Eymann, starts with foam sill sealer and strategically placed caulk in building his energy-tight homes.

Interior framing

Builders have been surprised to discover how much air leakage occurs through cracks and holes in interior partitions. Stop these leaks at the source by isolating interior stud cavities from basement, attic, and outside walls. Holes and notches for plumbing and wiring are the main culprits. But interruptions in the interior vapor barrier, where partitions meet outside walls and ceilings are also potential leaks. To prevent breaks in the interior air/vapor barrier, secure a piece of polyethylene on the ceiling or outside wall before erecting the interior partition. This piece can then be overlapped to join the full poly barrier when later installed. Make these and all laps in the poly barrier over a framing member (many prefer two) so that the sheets will be compressed together by the drywall. Holes drilled later through top or bottom plates into unconditioned spaces, should be sealed with a shot of foam or, if smaller, a glob of caulk.

Doors and windows

The standard approach to caulking doors and windows—between exterior casing and sid-

Steve Bliss is an associate editor at Solar Age.