

Air leakage

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*Seal areas between wood and concrete with foam sill seal.*



*Foam all penetrations in the top plates.*

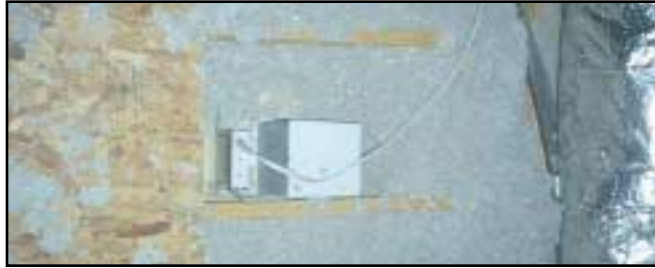


*Evidence of a leaky interior wall.*

### *Air leakage*

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- Recessed lights – Newer recessed lights are air-tight (AT) and have the ability to be in contact with the insulation ("IC" = Insulation Contact). Caulk the junction between the light and the ceiling's drywall.
- Heating and cooling system – Seal all HVAC penetrations such as refrigerant lines. Also seal all supply and return grill penetrations and thermostat wire holes.
- Plumbing – Before the drywall is applied, caulk or foam all plumbing penetrations. The drains and water inlet pipes under sinks are typical leakage locations. After the wallboard has been installed, fill the gap between the drain or pipe and the wallboard with caulk or foam.
- Dryer exhaust, gas pipe and refrigerator water – All penetrations are potential air leakage areas. The trim plate for the refrigerator water line needs to be caulked around its edges and firmly set in place to be airtight.
- Fireplaces – See page 36 and 37.
- Windows and doors – Most new windows and doors are reasonably air tight. Look carefully at field-installed weather-stripping and thresholds for light that comes through the cracks; where there's light, there's air leakage. Use non- or minimum-expanding foam to seal around windows and doors without doing any damage to these sensitive areas.
- Outlets – Electrical outlets and switch plates all leak a little; however, the air that passes through these comes from openings such as the top plate and other exterior wall penetrations. Take care of the basic air sealing, and outlet gaskets will not be needed.
- Floor joists – Cantilevered floors, as well as the joist cavities between floors, can let outside or attic air enter. Place pieces of exterior sheathing between these joists and seal with caulk. See Page 45.



*These recessed lights were IC rated but the insulation contractor was not notified.*



*This is an excellent example of a finished dryer vent and water shut-off valve.*



*Before the ceiling is insulated, caulk around all holes that were made through the sheetrock.*

## **Fireplaces and air leakage**

Of the 100 homes surveyed, 33 had no fireplace of any type. Of the 57 with a fireplace, 54 were vented gas, 11 were unvented gas and two burned wood. About one-third of the vented fireplaces were somewhat tight: they measured less than 5 percent of the home's total air leakage. Some fireplaces contributed as much as 20 percent of the home's total air leakage.



*The flu damper was shut before this fireplace was covered for the air leakage test. Note the effects of the blower door's pressure on this cover from the outside air that is leaking through the damper.*

## **Selection of fireplace covers to reduce air leakage**

Work with the homebuyer to purchase and install a glass fireplace cover that prevents unwanted air leakage. A vented fireplace burning gas or wood is essentially a hole in the ceiling through which a damper slows down, but does not seal off, the escape of conditioned air. Glass covers are typically designed to prevent sparks from jumping out of the fire. These covers do little to reduce the conditioned air that is always escaping up the stack. Builders are encouraged to work with the homebuyer to select and install an effective fireplace cover that fits their decor and reduces air leakage.

## **Sealed combustion fireplaces**

When typical "open combustion" fireplaces are installed in a tight home, there could be a drafting problem, especially when kitchen and bathroom exhaust fans are in operation. Also fireplaces that have "outside air for combustion" have dampers that are not air-tight. These allow outside air to enter and inside air to exit when the fireplace is not in operation.

The benefits of a sealed combustion fireplace pay back whether the fireplace is burning or not. When in operation, only outside air is used for combustion. When not in operation, the unit does not leak conditioned air up the flue.

