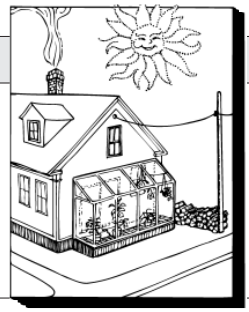
Keeping Cool Over Recessed Lights



by Bruce Sullivan

Recessed lights generate lots of heat. In fact, some operate at temperatures up to 200°F. In the uninsulated attics of many old houses, these fixtures may work for years without incident. Problems start when a contractor insulates the attic, usually as part of a larger renovation. If you pile insulation on top of a recessed fixture, there's no way for the heat to dissipate. As a result, the framing and other combustibles around the fixture can get hot enough to catch fire.

That's why building codes require attic insulation to be held back from recessed lights. Most codes follow the "3 to 4 rule" — they specify a clearance of between 3 and 4 inches (check your local code for the exact clearance). Less than 3 inches will create fire hazard, while more than 4 inches will result in unnecessary heat loss. Maintaining this clearance is relatively simple with fiberglass batts — you just cut the insulation short of the fixture. But with blown-in cellulose fiberglass, you need a baffle.

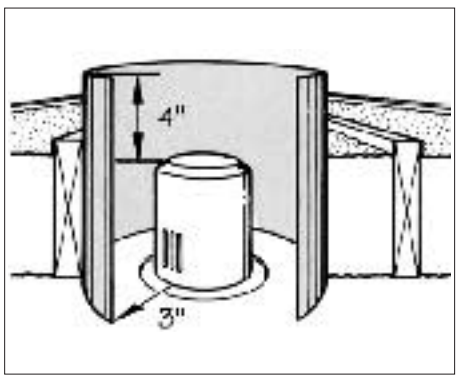


Figure 1. *Baffles keep loose-fill insulation away from hot recessed lights. Most codes require at least 3 inches of clearance between the fixture and the insulation. The baffle should extend 4 inches above the insulation, and should have an open top to let heat escape.*

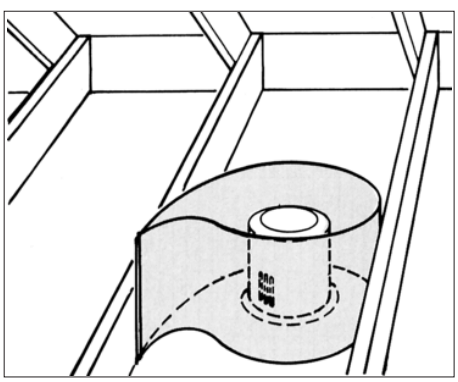


Figure 2. *Stapling a round baffle to a joist may mean leaving more than 4 inches of clearance, causing excessive heat loss. An alternative is to surround the fixture with a comma-shaped baffle whose tail is fastened to the joist.*

Using Baffles

Baffles prevent overheating by maintaining the proper clearance between the fixture and the insulation. They should be made from a solid flame-resistant material. Metal flashing is most common: It's easy to bend, can be fastened to the framing with staples, and can be cut with a pair of snips. Some codes let you baffle fixtures by using fiberglass batts as a dam. (Treated cardboard, which is sometimes used to baffle attic vents, is unacceptable for baffling recessed fixtures since it's combustible.) To keep them from being knocked out of place while the insulation is being installed, baffles must be firmly attached to something in the ceiling structure, such as ceiling joists or rafters.

In addition to following the 3 to 4-inch rule, a baffle should extend 4 inches above the insulation (see Figure 1). This will prevent insulation from falling into the baffle. Baffles should also have an open top so that any heat can escape.

Baffling fixtures between joists. The most common way to install a baffle is by stapling one end to a ceiling joist, then wrapping the free end around the fixture and stapling it to the same joist. Prefabricated baffles often don't work because each light presents a different set of conditions.

When a fixture is in the middle of a joist bay, a round baffle is easiest. However, the requirement that the baffle be stapled to a joist means that you may have to leave more than 4 inches of clearance. An alternative method is to form the baffle in the shape of a comma (Figure 2, page 94). The tail of the comma need only be wide enough to hold the baffle in place; the important dimension is the clearance around the light. Some installers find it easier to form baffles for odd shapes from two pieces of flashing. Use duct tape to hold the pieces together until the insulation is in place.

If the fixture is next to a ceiling joist, the only way to get the required 4-inch clearance is to straddle the joist with the baffle (Figure 3). This means cutting slots in the flashing, dropping the baffle over the joist, and stapling the tab to the top of the joist. Be sure the bottom of the baffle rests on the ceiling, so insulation can't slide underneath it.

Baffling near eaves. Recessed fixtures near eaves may have very little space above them. The lack of working room makes them tough to baffle. Instead of putting a baffle around the light, you may have to use the flash-

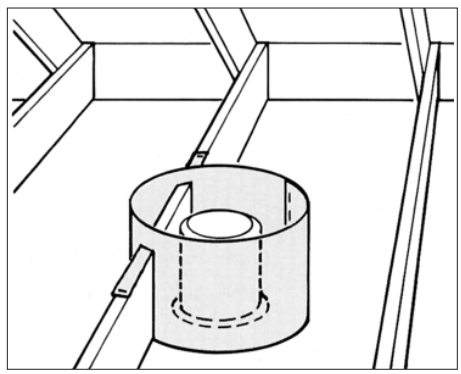


Figure 3. *If a fixture is next to a ceiling joist, notch the baffle around the joist.*

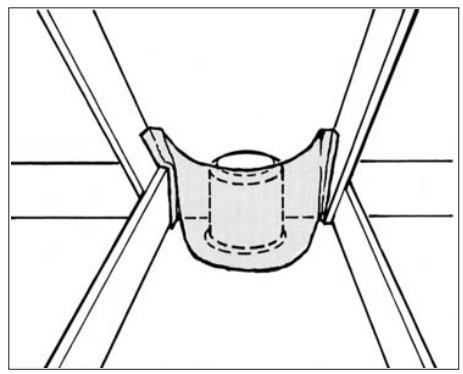


Figure 4. *The tight spacing around recessed lights near eaves may require you to build a dam at the end of the joist bay, leaving the eaves uninsulated.*

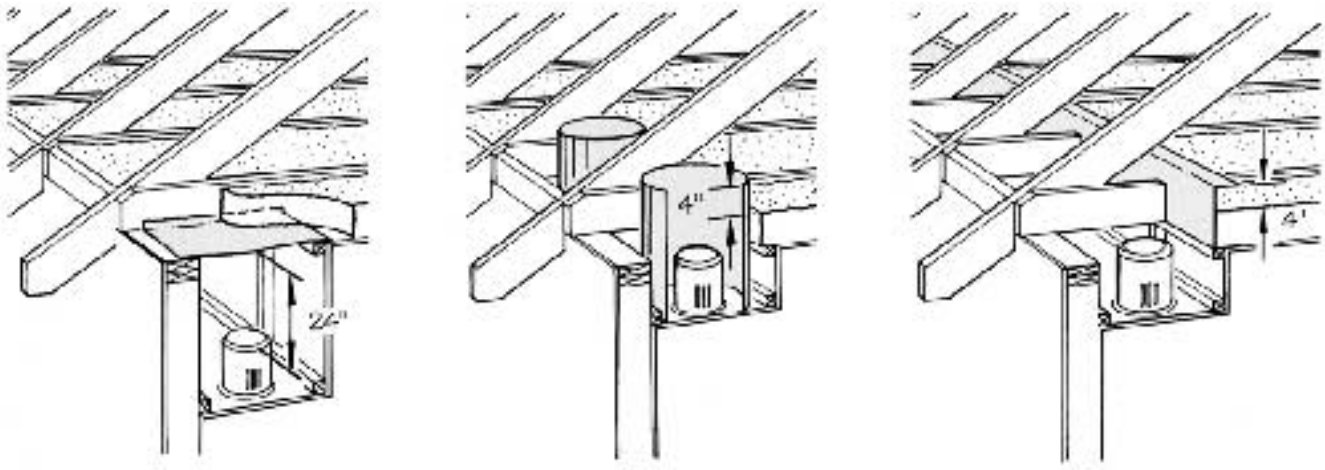


Figure 5. *There are three ways to baffle recessed lights in dropped soffits. If there's at least 24 inches between the top of the light and the top of the soffit, you can simply cap the soffit (left). For a shallow soffit, baffle each light individually (center). If the soffit is inaccessible from above, you may have to dam the joist bay (right).*

ing to make a dam near the end of the joist bay (Figure 4, page 96). Leave an opening at the top that's 4 inches above the finished insulation. Again, it may be easiest to use several smaller pieces in tight or odd-shaped spots.

Baffling soffits. Recessed lights are often mounted in soffits that drop below the level of the main ceiling (Figure 5). If the distance between the top of the fixture and the top of the soffit is at least 24 inches, you can place a flat cover over the top of the soffit (use flashing, drywall, or plywood), then lay insulation over the cover. If the soffit is shallower — and if it's accessible from the attic — you can use a baffle. Extend the baffle 4 inches above the finished level of the main attic insulation, and fill the soffit with insulation. Inaccessible soffits are a real problem: All you can do is dam the end of the joist bay, leaving the eaves uninsulated.

IC-Rated Fixtures

Baffles provide necessary fire protection, but their disadvantage is that they act as tiny chimneys that suck warm indoor air out of a house. This warm air carries water vapor that can soak the insulation and rot the roof sheathing.

Air leakage is only a problem, however, with fixtures that puncture the building's thermal boundary — the barrier between the home's conditioned space and the outdoors. If you're insulating a two-story house, one option would be to replace all recessed lights on the second floor with surface-mounted fixtures and to carefully seal around the outlet boxes.

If you must use recessed lights that penetrate the thermal boundary, look for fixtures that carry the Underwriters Laboratory "IC" rating — the IC stands for "insulation contact" and means they can be covered with insulation. While IC-rated fixtures are designed to handle the heat, not all of them are airtight. To prevent air leakage, you'll have to buy fixtures made for that purpose. These fixtures are certified for air leakage under ASTM E283 and are always IC-rated. ■

Bruce Sullivan is a principal of Iris Communications Inc. in Eugene, Ore., and the editor of Energy Source Builder.

Sources of Supply

The following manufacturers all make IC-rated recessed downlights that have been tested for airtightness under ASTM E283.

Capri Lighting
6430 E. Slauson Ave.
Los Angeles, CA 90040
213/726-1800

Halo Lighting
400 Busse Rd.
Elk Grove Village, IL 60007
708/956-8400

Hubbel Lighting Inc.
2000 Electric Way
Christianburg, VA 24073
703/382-6111

Juno Lighting Inc.
2001 S. Mt. Prospect Rd.
Des Plaines, IL 60017
708/827-9880

Lightolier
100 Lighting Way
Secaucus, NJ 07096
201/864-3000

Prescolite
1251 Doolittle Dr.
San Leandro, CA 94577
510/562-3500

Scientific Component Systems
2651 Dow Ave.
Tustin, CA 92680
714/730-3555