

INSTALLING A Skylight



I design and build custom sunroom additions in Chittenden County, Vt. (see “Building Custom Sunrooms,” 5/00). Many of these rooms include skylights as a practical way of adding glazing overhead. I install around 20 skylights each year, so I need to be certain that I don’t get called back to fix leaks. So far, I’ve never had a leak, which I attribute primarily to closely following the manufacturer’s installation instructions.

by Dennis Bates

Choosing a Skylight

When planning a sunroom, I usually work with the client to determine the right location for each skylight. I’ll make recommendations about what would look best and how to avoid glare within the room. In a sunroom that doubles as a TV room, for example, I might recommend optional shades.

Most customers appreciate the extra sunlight on a winter day but don’t realize that skylights can overheat a

Weave the flashings, membrane, and roofing together properly for a worry-free installation



Figure 1. Removing the sash makes handling safer and easier. Narrow strips of ceiling between skylights make layout mistakes really obvious, so special attention is given to accurate spacing during framing.



Figure 2. An improvised tool helps center the unit in the opening. The speed square rides along the rafter, and the combination square indicates the space between the unit and the rough opening. Note the layer of polystyrene insulation installed beneath the roof sheathing.

room in the summer. For that reason, I always steer clients toward a ventilating skylight — preferably manual rather than motorized. I feel more comfortable with the simplicity of the manual unit and like knowing I won't get a call in five years to repair or replace a motor. Plus, electronic units cost twice as much as manual units.

Nevertheless, some customers choose the motorized skylights because they like the convenience. Motorized units can be programmed to open and close on a schedule and will close automatically when it rains.

I prefer Velux skylights (Greenwood, S.C.; 800/888-3589, www.velux-america.com), simply because they've never given me any trouble, I'm comfortable with their flashing system, and I have the installation instructions memorized. The VS model is my favorite; it provides good ventilation and comes in a wide variety of sizes. Although I've used other manufacturers with success in the past, the distribution wasn't as extensive in my area, making their products harder to get and increasing lead times.

Square Framing First

During framing, I make an extra effort to get the openings perfectly sized and square. It makes setting the skylight — not to mention the trim — go more smoothly.

I leave the units boxed for transport and on the job site to lessen the chance of damage and keep all the parts together. A few days before the scheduled installation, we remove the manufacturer labels and prefinish the frames and sash. Prefinishing is neater and faster than working from a ladder after the units are installed. I'm seldom asked to paint the skylights, because the engineered beams that form the structural frame of our sunrooms are naturally attractive, and my customers usually want to continue the look of natural wood to the trim and millwork. We typically use a couple of coats of water-based

polyurethane. It provides good protection from humidity and condensation and cleans up easily.

Setting the Unit

In preparation for the skylight installation, the roof is sheathed and covered with 30-pound felt. I hold the felt back from the openings about 6 to 8 inches, so the waterproof underlayment can adhere to the roof deck. Up to this point, I've temporarily covered the openings with plywood to keep rain out of the room. Before bringing the skylights out onto the roof, I shingle up close to the openings. On hot days, I'll stop shingling a little lower on the roof so the shingles don't get scuffed while the skylights are being installed.

I start the skylight installation by first bending out the L-shaped mounting brackets and removing the cladding and sash, making the unit lighter and easier to handle. I pass the frame through the roof to a helper and stand inside to center it in the opening (see Figure 1, previous page). Centering ganged skylights is especially important, because trim and narrow sections of drywall will show up the discrepancy inside if the roof windows aren't spaced equally.

I've improvised a simple tool to help with centering: A speed square clamped to a combination square with a set of locking pliers makes it easy to check the reveals quickly and get them just right (Figure 2, previous page). I rest the units on a temporary cleat nailed to the roof, which makes positioning easier and safer (Figure 3). It also keeps multiple units in a straight line and prevents expensive skylights from sliding to an untimely demise.

Fastening

When I'm certain the skylight is centered, we nail through the mounting brackets in two opposite corners, using the heavy-duty ring-shank nails included with the skylight (Figure 4). We try to get them into the roof framing, but the



Figure 3. Tacking a 2x4 cleat to the sheathing keeps units in a straight line and prevents them from sliding off the roof. Once the units are secured, the cleat will be removed so shingling can continue.



Figure 4. After the carpenters nail down two of the four mounting brackets, they reinstall the sash to make sure that the unit is square (left). Necessary adjustments are made; then the other brackets are nailed off (right).



Figure 5. To reduce the chance of leaks, the author uses a single piece of membrane in the space between skylights. Folding the membrane in half helps to keep it from sticking to itself (top left). Aligning the membrane's edge on the first unit and smoothing toward the roof deck and back up the second unit minimizes wrinkles (top right). Cutting the corner allows the vertical leg to wrap around the top corner (above).

annular rings resist pull-out even if they're driven only into the roof sheathing. Next I reinstall the sash to check operation and ensure that the unit's frame is square and will remain so. Once the unit is in its final position and the sash operates without binding, we fasten through the other brackets, locking the skylight in place.

When we have all the skylights secured in their final position, I remove the cleat that helped with placement and we cut 10-inch-wide strips of self-adhering eaves membrane for a secondary water barrier. This is the last defense against water infiltration, and the manufacturer requires it. The skylight manufacturer makes its own membrane, but we generally use Grace Ice and Water Shield (Grace Construction Products, Cambridge, Mass.; 866/333-3726, www.graceconstruction.com) because it's readily available, less expensive, and it sticks better than other products I've tried.

We start at the bottom, attaching the membrane to the skylight and smoothing it onto the roof. The sides are next, with the areas between adjacent skylights the biggest challenge. With all



Figure 6. The top piece of membrane laps over the sides (left), and a slit cut outward forms a flap that folds around the corner (right). The membrane's leading edge is adhered to the roof deck under the felt.

hands on deck, we take positions at top, bottom, and middle and try to keep the membrane from sticking to itself and making a mess. The piece is cut so that it extends about 6 inches beyond the skylight, top and bottom. We adhere the membrane to one skylight and smooth it down toward the roof and back up onto the other skylight (Figure 5, previous page).

Finally, we install the top piece of membrane. It laps over the side pieces and is stuck to the roof sheathing under the felt (Figure 6). We use a hammer stapler to better secure the membrane to the skylight, stapling as close to the membrane's top edge as possible. This isn't as critical in warm temperatures, but I had one occasion where the membrane separated from the skylight and had to be redone. Since then, I always staple the membrane as extra insurance.

After the membrane is installed, we continue shingling up the roof to the bottom edge of the skylight. We know we have shingled far enough when the sill flashing, the bottom piece of flashing, covers up some of the shingles' 5-inch exposure (Figure 7). Special nails are provided for attaching the flashing: They're $\frac{3}{4}$ inch long



Figure 7. When the shingling reaches the skylight, the sill flashing is slid up from the bottom and fastened at the top corner with the manufacturer's special nails (left). The first piece of step flashing overlaps the sill flashing $3\frac{1}{2}$ inches. Where adjacent sill flashings overlap, urethane sealant provides extra insurance against leaks (right).

Figure 8. Cutting the last piece of step flashing at the fold allows it to be bent around the skylight's top and nailed like the others to the side of the frame.



Figure 9. The leading edge of the head flashing (top left) gets covered with a second strip of eaves membrane (top right). Note that the felt is lifted so the membrane can be adhered to the roof deck. Notching the shingles around the skylights maintains a 4-inch exposure (above).

so they won't poke through the frame, and they're noncorrosive to the aluminum.

We shingle up the sides, weaving the step flashing into the courses. The manufacturer specifies at least a 3¹/₂-inch overlap on every piece, and the pieces are nailed near the top on the downhill edge. The last piece of step flashing is slit so it can bend around the top corner (Figure 8).

The small section of roofing between ganged units gets a U-shaped piece of flashing rather than step flashing. We bend our own in the shop out of high-quality bronze aluminum trim coil; if you don't have a brake, the manufacturer offers a



pre-bent U-shaped flashing as well. We make our own flashing because I like to have flexibility in spacing the units. The U-shaped metal is held in place by the cladding when it's reinstalled. Next, we install the head flashing over the step flashing and shingles, but we don't install the screws (Figure 9, previous page). We put a strip of eaves membrane over the head flashing and under the felt. Shingling is easier now because we no longer have to cut and fit around the skylights, but it's important to leave a 2³/₈- to 4-inch space between the top of the skylight and the shingles. That space prevents roofing nails from punching holes in the head flashing and allows water and debris to get around the skylight unimpeded.

Next we reinstall the cladding that was taken off when the sash was removed (Figure 10). Those pieces, held in place by screws, give the skylight its finished look and act as counter-flashing for the U-flashing and step flashing. We start at the bottom, continue up the sides, and finish with the top piece. 



Figure 10. Reinstalling the skylight's cladding completes the process. The bottom goes on first (top left). Slots in the bottom receive the side pieces (top right). Plastic inserts in the sides receive the screws inserted through the head flashing (above left). Finally, the top cladding piece is slipped over the head flashing and secured with two screws (above right).

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