

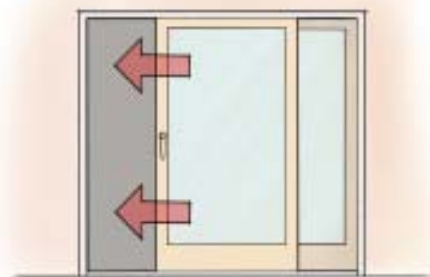
## Lift-and-Slide Doors

**Q:** I'm interested in learning more about lift-and-slide doors. We have trouble with water intrusion from wind-driven rain through sliding glass doors. How does a lift-and-slide door work? I've read that when the door locks, it seats down in its track, compressing the weather stripping. What happens at the head and the sides when the door slips into its track?

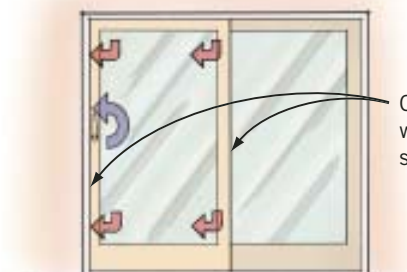
**A:** Many of the lift-and-slide doors from makers such as Fenevations, HH Windows and Doors, Weiland Sliding Doors & Windows, and Zeluck use a European-style locking mechanism that moves the door up and down vertically. Hannes Hase of HH Window & Doors ([www.hhwindows.com](http://www.hhwindows.com)) compares the mechanism to a sliding door on a minivan. "In essence, we're separating the sliding action from the locking action," he explains.

When open, the door sits on grooved rollers that carry the door along a track. The rollers can carry a substantial amount of weight, so you can get some fairly large door panels — on the order of 10 feet wide. Such a large panel with an impact-resistant-glass unit weighs several hundred pounds, but it rolls effortlessly without running over the sill gaskets.

When locked, the rollers retract and the door eases down, compressing the sill gasket on each side of the track (see illustration, right). At the same time, wedge-shaped locking pins pull the door to one side, compressing the gaskets on each side. The pins engage in the jamb at multiple points along the leading

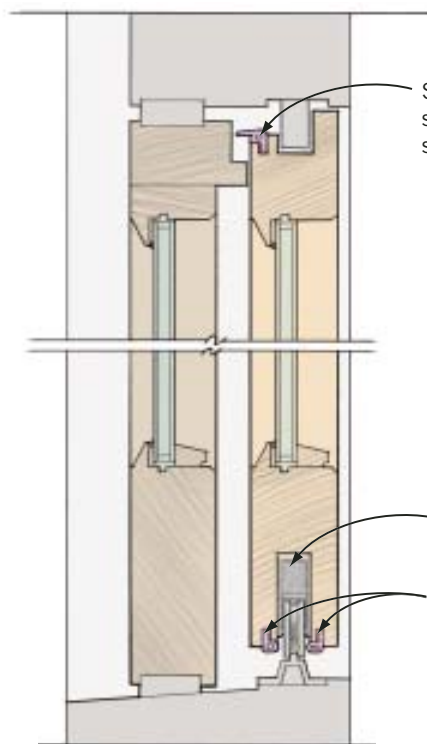


Unlocked



Continuous weather stripping seals both sides

Locked

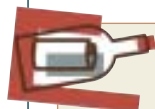


When locked, rollers retract

Bulb weather stripping seals along sill

Unlocked

As a lift-and-slide door is locked, the rollers retract, dropping the door, while a multipoint locking at the jamb pulls the door into the jamb. This action seals the door on four sides against wind-driven rain and air leakage



**Got a question?**

**We want to hear from you!**

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edge of the locking panel, providing a very secure, tight connection. At the top, a simple “slab gasket” rests against a stop to seal the head, as shown.

This system can accommodate rather large panels (up to about 10 x 10 feet), and multiple units can be ganged together to create a “wall” of glass that can be opened to the outdoors. In this case, the opening requires a double track, but because the track has a low profile to begin with, it’s not much of an obstruction.

While the system has proved extremely reliable, Hase points to a new type of hardware introduced less than a year ago in Europe by Roto Frank ([www.rotohardware.com](http://www.rotohardware.com)). This system actually retracts the gaskets. With this new system, the door stays at essentially the same height at all times. The advantage may be more even compression, plus ease of operation. You don’t need the large handle because you’re not relying on that leverage to lift the whole door panel. Hase is looking seriously at this system but wants to see what kind of track record it has in the market first.

## Crawlspace Mold



■ We’ve encountered mold problems in the crawl-  
■ spaces of single-family homes built on Pawleys

Island, S.C. We’d like your suggestions on how to correct crawlspace mold and how to prevent it in new construction.

The crawlspaces are on homes that are less than five years old.

The homes have well-drained soils and perimeter drainage around a block foundation. The floors are about five blocks from grade level, and there are insulated HVAC ducts and plumbing running through the crawlspace. The crawlspace floor was covered with plastic (6-inch overlap at seams) after termite treatment. Plastic vents (10<sup>1</sup>/<sub>2</sub> x 6 inches) have been installed every 8 to 10 feet per the building code, and the floor was insulated between the floor joists.



It’s hard to diagnose a mold problem without inspecting it firsthand. Does the crawlspace area feel damp? Are there signs of liquid water clinging to the poly on the ground? Is there condensation on the cold-water pipes running through that space? Mold needs moisture to thrive, and the only way to correct an existing problem is to eliminate this source of moisture. If there are no obvious sources of

excess water (plumbing leak, flood, runoff draining into crawlspace area, etc.), then the moisture may be coming from condensation.

In a vented crawlspace in a humid climate, the vents introduce ample humid air to the crawlspace. Added moisture comes from the concrete block curing in the first year. In the relatively cool crawlspace, this moisture is likely to condense on surfaces, providing the water mold needs to grow. Unfortunately, most “vented” crawlspaces are very slow to dry in a humid climate. While vents are supposed to help the space dry, they rarely do unless the vents are aligned to cross-ventilate and the house is sited to allow good airflow. In addition, you have supply ducts running through this space. How well are they insulated? Are they sealed with mastic at the joints? Any leaks, or insulation less than R-6 (R-8 is much better), will further cool that space. The cooler it is, the more likely the high humidity in the air will condense.

#### WHAT'S THE CURE?

Ultimately, to prevent these problems in new construction, you're going to have to convince the inspectors that there's a better way to detail a crawlspace.

The solution in new construction, which is allowed by the International Building Code, is to build a “conditioned” crawlspace (see *Soundings*, May/June 2006; [www.coastalcontractor.net](http://www.coastalcontractor.net)). When building a conditioned crawlspace, you are bringing the crawlspace inside the building enclosure, sealing out hot, humid air and purposefully conditioning the air in there, just like in the living space. A full description of this approach is available from Building Science Corp. ([www.buildingscience.com/resources/foundations/conditioned\\_crawl.pdf](http://www.buildingscience.com/resources/foundations/conditioned_crawl.pdf)). As

Do not use bleach to solve a mold problem. While it may remove the stain, it does not remove mold spores. And bleach presents a hazard to workers' skin and lungs.

Joe Lstiburek and company make clear, the code does not allow unvented crawlspaces, but it does allow conditioned crawlspaces, and it is crucial that you (and the local inspector) understand the difference.

The much harder solution is what to do about an existing crawlspace with mold. That's best left to a qualified specialty contractor. Remediating mold is awful work. The only way to get rid of it is to physically remove it from the surfaces throughout the crawlspace. Technically, mold-contaminated non-porous surfaces like sheet metal or aluminum-faced fiberboard ductwork can be wiped clean with an EPA-registered disinfectant such as Perma-Wash ([www.zinsser.com](http://www.zinsser.com)), but semiporous materials like wood should be sanded or media-blasted. Porous materials such as fibrous insulation (or gypsum board, if there is any) must be removed and replaced. It's critical that you seal the work area while undergoing this work to prevent dispersing the mold spores throughout the house above.

Here's what you *don't* want to do: Do not use bleach to solve a mold problem. While it may remove the mold stain on the surface, bleach does not remove mold spores, which can cause adverse health effects even if they are dead. Bleach is also highly corrosive to materials and to workers' skin and lungs. Mold must be physically removed from con-

taminated materials. If mold and bacterial growth resulted from black water or contaminated floodwater, materials also must be disinfected with an EPA-registered disinfectant.

Over-painting will not fix the problem, either. Mold will continue to grow as long as adequate moisture and nutrients exist, even if it's been painted over. The correct approach is:

- (1) Stop the moisture intrusion.
- (2) For large areas of mold growth, establish appropriate containment and worker and occupant protection.
- (3) Dry the affected area.
- (4) Decontaminate or remove damaged materials. Only an EPA-registered disinfectant will work for decontaminating materials.
- (5) Safely dispose of any removed materials to prevent further contamination of the surrounding areas.

Air sampling is not necessarily the best method to test for a mold problem. Be aware of this if you are retaining a professional mold remediator. Air sampling alone may or may not identify a serious mold problem. In many cases where mold is growing on concealed surfaces, such as on sheathing or dry-wall within wall cavities, air sampling does not reveal elevated concentrations of mold in the room air. There are also times when air sampling finds elevated mold spores indoors that are higher than outdoor concentrations, but significant mold growth is not present in the home. Because the presence of moisture can be a reasonable predictor of a mold or microbial problem, an effective investigation should take moisture levels into account. —  
*Clayton DeKorne*