



Replace a sticky slider or make  
a wall of glass — today's patio doors are  
stylish, durable, and secure



**F**or some people, patio doors evoke memories of wafting summer breezes and unobstructed views. But for others, the words conjure images of pitted aluminum frames, fogged glass, balky rollers, and flimsy locks. Don't despair: The good things have gotten better and the bad have changed. Materials now last longer, look better, and need less maintenance, and styles range from hinged French doors with custom grilles to whole walls of glass panels that fold out of the way.

Unchanged are the flexible design advantages of patio doors. They are both door and window, providing access to the outdoors, light and fresh air, and wider views than all but the largest windows. Patio doors are available in widths from a few feet to 40 feet or more. They can be designed and installed in a variety of configurations, making them adaptable to small or large rooms and compatible with a range of architectural styles.

There are two types of patio doors—swinging and sliding—and because they are mostly glass, they have many of the characteristics of

# Patio Doors

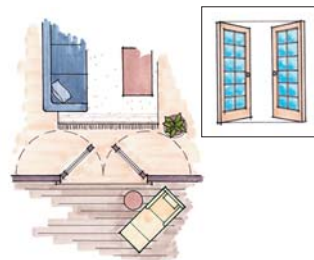
BY SCOTT GIBSON

modern windows (see *Inspired House* Jan./Feb. 2004, "Windows Inside and Out"). Like windows, patio doors and frames are made of a variety of materials and finishes—wood, aluminum and vinyl cladding, steel, extruded vinyl, and fiberglass. Hardware styles and locking systems vary considerably, with choices more abundant as the price goes up. For more on manufacturers and styles, see Resources on page 94.

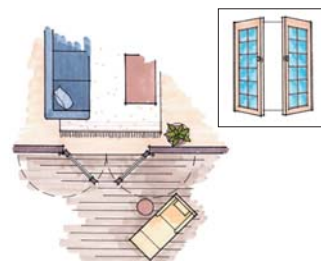
## Swinging: in or out

Although the term "French doors" is often used generically to refer to all varieties of swinging and sliding doors, traditional French doors consist of a pair of hinged doors that open from the middle and have a wider frame at the top, bottom, and sides (referred to as rails and stiles) than do other patio doors. Swinging patio doors are available in many widths, from a single-panel door about 2 feet wide to four-panel units 14 feet wide, and specialty doors even wider. Heights typically range from 6 feet 7 inches to 8 feet.

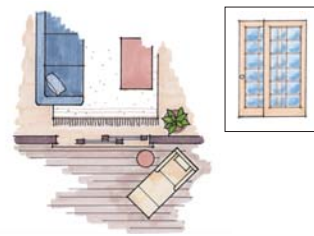
## A DOOR'S MOVEMENT AFFECTS FURNITURE PLACEMENT



IN-SWINGING



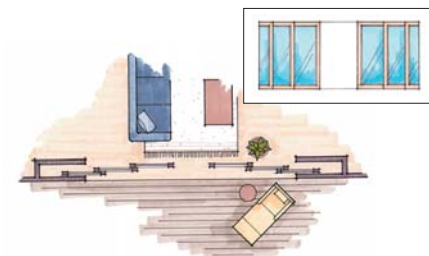
OUT-SWINGING



SLIDING



SLIDE-FOLD



TELESCOPING SLIDING



**THESE DOORS TILT IN AT THE TOP** and also open conventionally. The multipoint locking system secures the entire door perimeter, ensuring a tight seal and giving protection from air, water, and intruders.



## SWINGING DOORS

**PROS** Available in many sizes and styles.

- In-swing and out-swing options make it easy to tailor a door to a room.
- Arched doors are available.

**CONS** Slightly more expensive than sliding doors of the same size and type. ■ Hinged doors in the largest stock size are somewhat smaller than the largest sliding doors. ■ Swinging doors take up room and limit what can be placed near the door opening. ■ Out-swinging doors can make insect screens problematic.

**PRICES** For a two-panel unit 6 feet wide, costs range from about \$400 for steel-skinned panels with a core of insulating foam to about \$3,400 for aluminum French doors with simulated divided lights, a multipoint locking system, and energy-efficient glass. ■ A 14-foot-wide unit lists for \$6,312 from Marvin. (Costs vary by region and depend on options.)

With a pair of swinging doors, one or both of the doors can be made to open (what the industry calls “active”), and they can be hinged either from the door jamb or at the center of the unit, in which case one panel remains stationary. In larger units, stationary and active panels can be combined in a number of ways.

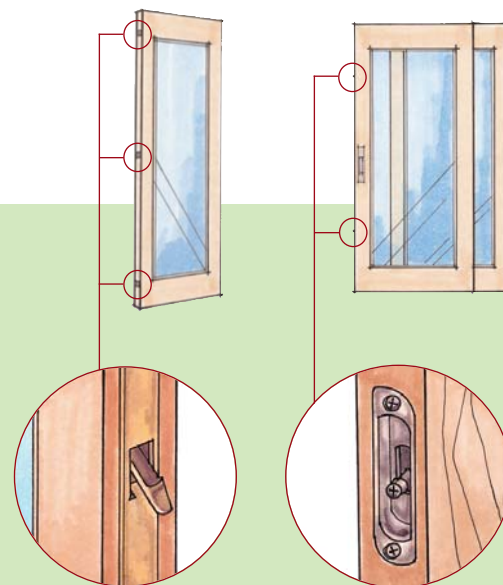
Just like other entry doors, swinging patio doors are usually installed so the door swings into the house, called an in-swing. While throwing open a pair of in-swinging doors might seem like the ultimate way to welcome someone into your house, the sweep of the doors can take up valuable floor space in a small room (illustration, p. 33). A variation on the in-swinging patio door is the tilt-and-turn door. Crank the handle one way and the door tilts in at the top, providing indirect ventilation. Turn the handle in the other direction and the door swings inward.

Out-swinging doors also are available. Conversely, their sweep can interfere with outdoor furniture or require you to step back off a narrow deck to open them. Special tamper-resistant hinges prevent would-be intruders from popping out hinge pins and removing the doors from the outside. Manufacturers generally offer more sizes for in-swinging doors than for out-swings.

The installation of insect screens can be a problem with out-swinging doors. Many companies don’t offer factory screens for their lines of



**FRENCH DOORS HINGED AT THE CENTER** and installed side-by-side mean that furniture can be placed in front of stationary panels.



### SWINGING-DOOR LOCK

Reinforced latches engage at three points.

### SLIDING-DOOR LOCK

Vertical bolts grab the door jamb at two points.

## MULTIPOINT LOCKS ARE MORE SECURE

**H**ardware for swinging patio doors is similar to what you'll find on a typical entry door. Doors closing against the jamb are secured with a latch and a deadbolt, just as your front door is. Increasingly, however, door manufacturers are offering "multipoint" locking systems. Pins activated by the handle engage the jamb or the sill in three or four points, making it harder for an intruder to force the door open.

Multipoint locks also draw the door firmly against the weatherstripping, making a better seal. Therma-Tru, for instance, says its stainless-steel pins are tapered so they tighten the door more effectively than does a simple spring-loaded latch. Multipoint locks are a standard feature on some doors and an option on others. If security is a big concern, ask your contractor or salesperson whether the door has passed forced-entry resistance testing.

For sliding doors, locking systems are somewhat different from those on hinged doors because the door panel slides directly into the jamb rather than swinging against it. Multipoint locking systems that grab the jamb in more than one place are available, as are foot-operated locks that engage the sill. And with a slider, you can always make a low-tech lock by cutting a piece of 2x4 lumber and dropping it into the track to prevent the active door from opening.

out-swinging patio doors. The problem can be solved with a retractable screen that mounts to the jamb and works something like an old-fashioned window shade (see sidebar, p. 38). These screens don't take up any interior space and don't interfere with the operation of the door.

Out-swinging doors may be more attractive where insect screens aren't needed at all, such as in a small dining room that opens to a screened porch or in parts of the country where bugs aren't a problem. The two active doors can be folded back against exterior walls, leaving the door opening completely unimpeded.

In areas subject to high winds and heavy rains, out-swinging doors may have an advantage for keeping the weather at bay. The harder the wind blows, the tighter the door is pressed against the door jambs and weatherstripping. In-swinging doors are held closed by locking mechanisms alone.

### A new era for sliding doors

It used to be that sliding doors were notorious for poor operation, crummy locks, and screens that jammed on their tracks. Although there are still plenty of economy sliders on the market, lots of high-



## ON OR BETWEEN THE PANES GRILLES, BLINDS, AND SHADES

**GRILLE PATTERNS**, called muntins or mullions, often dictate the style of a patio door. The most traditional pattern is a series of uniform rectangular openings, like those you'd find on a French door or a colonial-style window. These patterns block more light than other styles do, but they also fit comfortably with traditionally styled houses. If your taste runs to prairie style or Arts-and-Crafts architecture, stock and even completely custom grille patterns can be ordered to match.

Things between the panes—grilles, blinds, and shades—also differentiate the new generation of patio doors. Grilles tucked between the panes of glass make window cleaning easier.

**Blinds, which can raise, lower, and tilt, or only tilt, increase privacy, reduce sound transmission, and boost energy efficiency. Some manufacturers offer fabric shades between the panes, which**

**have benefits similar to those of between-the-panes blinds but create a softer look.**

**ENCLOSED BLINDS**  
*Easy cleaning and privacy on demand are just a couple of the benefits of blinds sealed between two panes of glass.*



end choices balance the scales. Marvin Windows and Doors introduced a sliding door in the '80s that became one of its top sellers, and a number of manufacturers now offer patio doors of similar construction and quality. Sliding doors and swinging doors may operate differently, but they share many of the same components—glass and grille types, frame materials, and cladding.

Unlike swinging patio doors, which can be configured as several single door panels, sliders must be at least two panels wide, and in most cases, one panel is fixed. This makes them slightly less flexible than swinging-door sets. But sliding patio doors are available in larger stock sizes than swinging doors are—up to 16 feet wide—with two fixed panels on the outside and two active panels at the center.

Roller assemblies keep doors operating smoothly, and around salt water the optional stainless-steel rollers from some manufacturers will last longer than zinc-coated ones. Screens may be either attached to rollers that ride in a track on the sill or top-mounted, an arrangement that tends to operate more smoothly.





## SLIDING DOORS

**PROS** Usually less expensive than similar-size swinging doors. ■ Fewer limits on what can be placed near door openings, because they don't swing in or out. ■ Widest stock sizes are slightly larger than what's available for swinging doors.

**CONS** Doors must be at least two panels wide, and in two-panel designs, only one panel is operable. ■ Effective weather-sealing may be more difficult. ■ Door shapes are limited to rectangles—an arched top isn't possible.

**PRICES** Extruded vinyl sliders start at about \$300 for a two-panel door 6 feet wide with standard glass. ■ A two-panel French-style door unit with energy-efficient glass and a heavy-duty screen is about \$3,000. Four-panel, 16-foot-wide doors cost \$5,000 or more, depending on options.

Some manufacturers say their sliding and swinging doors are built to the same standards for weather tightness, but that may not be universally true. "Swinging-type products are easier to seal and to make watertight and airtight," says Jeff Lowinski, vice president for technology marketing at the Window & Door Manufacturers Association. "To a certain extent, they are easier to make structurally sound than are sliding products, although that doesn't mean it can't be done."

### Opening up a wall

Taking patio doors even further are mechanisms that allow entire walls of glass to be opened. Slide-fold doors hinge together like pleats on an accordion, and telescoping sliding doors glide past one another (bottom two illustrations, p. 33). All use European-designed hardware that makes operation of these large, multiple-panel configurations smooth and easy. Nana Wall Systems says it has installed a slide-fold wall system 88 feet wide in a South Dakota house, and that, theoretically, there is no width limit. Nana Wall's horizontal sliding wall system uses panels that pivot as well as slide, allowing them to travel down a single track for out-of-the-way storage. The top-hung panels are not hinged to each other, as in folding systems, so individual panels can be moved separately. Of course, structural support is critical to any large opening and must be addressed early in planning.

Telescoping sliding doors look like standard sliding patio doors, but the panels glide back onto fixed end panels or into wall pockets. Loewen offers a system that all but eliminates the raised track in the floor. Pushing down on the door handle lifts the panel so it can slide



**TRADITIONAL-LOOKING SLIDING GLASS DOORS** get an update with natural wood interiors and low-e glass. This energy efficient glass helps reduce heat transfer, so rooms stay warmer in winter and cooler in summer.

**STACKED WINDOWS** Three sets of patio doors are topped by transom windows that bring in additional light.

## SCREENS THAT DISAPPEAR

### CONVENTIONAL SCREEN

**DOORS** on hinges are impractical for some kinds of patio doors—outward-swinging French doors, for example. One alternative is retractable screens, which, when not needed, roll up inside an aluminum casing mounted to the door jamb. Guided by tracks at the top and bottom of the door opening, screens are kept taut by a spring-loaded mechanism in the housing. A magnetic catch keeps the door closed snugly.


Single- and double-door designs are typically available in more than half a dozen colors. Screens are made to order, and maximum sizes vary by manufacturer. They can be made to fit openings up to 10 feet high and 8 feet wide. Prices range from \$325 for a single door to \$700 for a standard-height double door. Versions are available for in-swinging, out-swinging, and sliding doors.



**A WINDOW WALL THAT VANISHES**  
*Slide-fold doors get pushed to the sides to remove the barrier between indoors and out and to create unobstructed views.*

along a 3/16-inch-high track set in the floor. This system allows for very large expanses of glass panels that can weigh up to 500 pounds (photo below). When you pull the handle up it lowers the panel to the floor, creating a weather-tight seal.

The slide-fold door system from Quantum has multiple hinged-together panels with a sliding and folding mechanism. You can specify in-swinging or out-swinging doors, and they fold together like an accordion to create openings up to 42 feet wide. Panels can be opened from one end or from the middle; custom configurations are also available. A single door panel at one end of the group can open and close for everyday use when you don't want to open the whole wall.

While telescoping and sliding doors can be screened, doors that open like an accordion are more difficult to screen. To solve this problem, Nana Wall offers the Opening Screen Wall, a motorized, overhead, retractable screen that can be used for openings up to 26 feet wide. The screen retracts upward and out of sight when not in use. 

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**See Resources on page 94.**



**LARGE GLASS PANELS** weighing up to 500 pounds roll smoothly and easily with Loewen's Lift-Slide door.



# Choose materials that are durable, safe, and just right for your home

## Frame

Some New England traditionalists still prefer wood, but door manufacturers now use a variety of other materials that need less maintenance, are less prone to warping, and last longer. Aluminum and vinyl cladding over a core of engineered wood is common. Both aluminum and vinyl are long-lasting and need little maintenance. Door frames and panels made from hollow vinyl extrusions are the least expensive option and often look like it. Fiberglass door systems embossed to look like wood look surprisingly realistic. Sills and door jambs made of fiberglass or cellular PVC won't rot.

## Glass

All patio doors must be fitted with safety glass, which if broken will shatter into small pieces instead of huge, saberlike shards. Code requirements for doors and windows in some parts of the country are even more stringent, especially in coastal, hurricane-prone regions like Dade County, Fla. Laminated glass—two sheets fused together with a layer of transparent plastic between them—is designed to not shatter when struck by wind-borne debris, and it may be required. And because of their increased strength, laminated glass doors are sometimes recommended in high-crime areas.

Glass options range from a single thickness to an insulated double-layer of glass with a low-e coating. Low-e is more expensive, but Andersen Windows estimates low-e glass is 35 percent more efficient during the heating season and 41 percent

more efficient for cooling. Check the National Fenestration Rating Council label on the glass, which lists thermal efficiency (its U-value) and its solar-heat-gain factor: The lower the values, the better its thermal efficiency and solar shielding. For recommended levels, visit the Department of Energy's Energy Star Program on the Web ([www.energystar.gov](http://www.energystar.gov)).

## Hardware

When it comes to door handles, expect a few basic choices for low- to mid-priced doors and more options for higher-priced lines. Bronze, chrome, nickel, and brass finishes are common, and custom hardware can be ordered for some patio door lines. Some swinging doors come prebored so that just about any exterior door hardware can be used. Fewer hardware options are available for sliding doors simply because of the latch-locking mechanism.

## Stock versus custom

Depending on your needs, you may find what you're looking for as a stock item, or you may have to order custom patio doors. Several stock doors together can create a custom look. What about that odd-size opening? The least expensive option is to combine a standard door unit and a fixed panel or two of a different size. If you want to order a custom door, local door and window shops may be able to fabricate one, and larger manufacturers like Marvin and Andersen also offer this option. Expect to pay more and wait longer for a custom door.

**EMBOSS TO LOOK LIKE WOOD** Fiberglass doors that are stainable and embossed for a wood-grain effect, like those made by Thermo-Tru, look very realistic. Sills and door frames made of fiberglass are durable and rot-resistant.



Bottom photo: courtesy of Thermo-Tru

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