

Pick the Perfect Patio Door

Check the hardware, and consider the energy-performance rating for a smart purchase

BY PATRICK McCOMBE

We ask a lot of patio doors. These huge panels of glass that provide wide-open views of the outdoors are expected to operate effortlessly while keeping us safe from drenching rains, high winds, pests, and intruders. We also expect them to keep our indoor-living spaces comfortable during the depths of winter and the dog days of summer. If that weren't enough, we want our patio doors to be attractive, complementing both the interior and exterior of our homes.

With myriad choices available, consumers buying patio doors face a challenge. The typical 6-ft.-wide patio door comes in dozens of styles and can cost anywhere from several

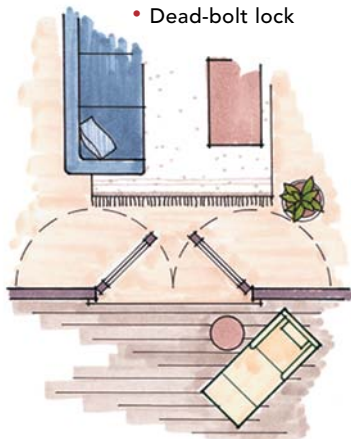
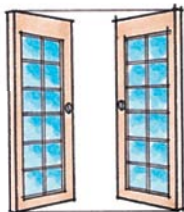
 Acme Window and Door Company Millennium 2000® Vinyl-Clad Wood Frame Double Glazing - Argon Fill - Low-E Product Type: Inswing French <small>National Fenestration Rating Council</small>	
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S.A.P.)	Solar Heat Gain Coefficient
0.35	0.32
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance	Air Leakage (U.S.A.P.)
0.51	0.2
<small>Manufacture certifies that these ratings conform to applicable NFRC procedures for determining window product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>	

PERFORMANCE MUST-HAVES

As with most consumer goods, you get what you pay for in a patio door. Spend more, and quality, security, and efficiency increase. Here are some must-have performance levels and features for a decent patio door.

HINGED PATIO DOORS

- DP rating or PG rating of 40 or higher
- Adjustable hinges
- Dead-bolt lock



SLIDING PATIO DOORS

- PG rating of 40 or higher
- Low-friction rollers
- Sturdy screen



ALL PATIO DOORS

- Multipoint lock
- U-factor 0.3
- Warm-climate SHGC 0.30 or lower
- Cold-climate SHGC 0.39 or higher





SWING VS. SLIDE

Sliding doors (sometimes described as gliding) have rollers that ride on tracks built into the door frame. The most common models have two panels, one of which is fixed. Either panel can be specified to operate at the time of ordering, although they're seldom switchable in the field. The big advantage of sliding doors is that they don't take up floor space when opened, which allows furniture to be placed closer to the door without interfering with the door's operation.

Unfortunately, sliding doors are the toughest to seal tightly, so inexpensive models typically have greater amounts of air leakage compared to similarly priced hinged doors. Sliding units are available in sizes from about 5 ft. wide and 6 ft. 8 in. tall to more than 16 ft. wide and 8 ft. tall. Transom tops can bring the total height to 10 ft. or more.

Hinged patio doors are available in three basic configurations: single-panel doors, center-hinge doors, and French doors. They come in a wide range of sizes, from about 3-ft.-wide, 6-ft.-8-in.-tall single-door units to multiple-panel units of almost unlimited width and height. Two-panel doors with one swinging panel are often described as center-hinge models. Center-hinge doors take up less floor space than doors with two operating panels, which are known as French doors. Center-hinge doors are easier to install and adjust than French doors, and they're generally more tolerant of rough openings that aren't quite plumb, level, and square.

By contrast, French doors are finicky to install and are less tolerant of imperfect openings. French doors also take up the most floor space. However, they're great at seamlessly connecting indoor and outdoor living spaces.

hundred to several thousand dollars. But fear not. Here, I'll give you the tools that you need so that you can choose the best patio door for your situation.

Performance ratings are easy to come by

According to Rob Garofalo, patio-door product manager for Andersen, the best way to know you're getting a quality sliding patio door is to look for the performance-grade (PG) rating. This rating, developed jointly by the Window & Door Manufacturers Association and the American Architectural Manufacturers Association, replaces the former set of standards known as the design-pressure (DP) rating. Performance grade is a measure of a door's resistance to high winds and forced entry as well as its ability to keep out air and water during repeated cycles of positive and negative pressure. These cycles of pressurization and depressurization are common during strong storms and high winds. The scale ranges from PG 20 to PG 80. Garofalo suggests choosing a door with a PG rating of at least 40 in most of the country, with higher ratings for doors in coastal zones. The higher rating for coastal zones translates into a door that better resists wind and water during hurricanes and tropical storms.

You'll find PG ratings for all sliding doors, but unfortunately, PG ratings aren't yet standard for hinged patio doors, though many manufacturers still provide them for all or most of their hinged patio doors. If a door doesn't have a PG rating, you'll have to rely on the old design-pressure guidelines. A door with a DP rating of 40 is a good starting point for all but coastal zones. In either case, Christine Marvin of Marvin Windows urges door buyers to make an apples-to-apples comparison for a door's intended use. For example, doors with a "light-commercial" designation are held to a higher standard than those specified as "residential."

Of course, it's also a good idea to check a door's thermal performance. The easiest way is to look for an Energy Star logo, but a more thorough check is to identify the U-factor posted on the National Fenestration Rating Council (NFRC) label affixed to the glass. The lower the U-factor, the greater a window's resistance to heat flow and the better its insulating properties. This information is also available in catalogs and on manufacturer websites.

Look for doors with a U-factor of 0.3 or lower, which is typical for a door with high-performance insulated glass. This glass is also better at blocking carpet- and furniture-fading UV-rays. The other valuable

PATIO-DOOR MATERIALS

Patio doors are made of five basic materials: aluminum, fiberglass, steel, vinyl, and wood. All have strengths and weaknesses. Pricing assumes 6-ft.-wide by 6-ft. 8-in.-tall entry-level products with basic hardware and no extras. Larger sizes and options such as divided lites, factory-finishing, and upgraded hardware can add significantly to the cost.



ALUMINUM \$400 to \$1200

Aluminum can be uncomfortably cold during the winter and even frost over in cold climates. Aluminum's big advantages are strength and resistance to heat, even when the doors are painted a dark color. This makes aluminum doors popular where hot temperatures and dark exterior colors are the norm.

PROS

- Stands up to extreme heat even in dark colors
- Rot and insect resistant
- Inexpensive yet durable

CONS

- Unsuitable for cold climates
- Limited interior finishes
- Plain appearance



FIBERGLASS \$900 to \$2000

Not surprisingly, fiberglass has a rate of expansion that closely matches glass, so it's stable in all temperatures. It's also about three times stronger than vinyl and won't rot. Fiberglass doors are generally more expensive than aluminum, steel, and vinyl doors.

PROS

- Stable in all temperatures
- Three times stronger than vinyl
- Rot and insect resistant

CONS

- More expensive than steel, vinyl, or aluminum
- Some versions have fake-looking wood grain
- Often requires regular coats of paint or stain

IN-SWING OR OUT-SWING?

Hinged patio doors are available in in-swing and out-swing models. In-swing models dominate the market in Northern climates because snow and ice buildup can make a door difficult or impossible to open. In warmer parts of the country, both in-swing and out-swing doors are common. Out-swing doors perform especially well in coastal and other high-wind areas. As the wind blows harder against an out-swing door, more pressure is exerted on the bottom sweep and the weatherstripping, resulting in better resistance to wind and water.

The amount of space available also can influence the choice between an out-swing or an in-swing door. For tight indoor areas, an out-swing door makes more sense, because the door swing won't affect furniture placement inside the house. For tight outdoor areas, the opposite is true.



STEEL \$400 to \$1000

Steel doors have cores of wood and insulating foam. This gives the thin steel skin strength and provides a means of attaching hinges and hardware. Steel doors rust without regular coats of paint. Steel doors are among the most affordable patio doors.

PROS

- Inexpensive
- Strong
- Temperature stable
- Rot and insect resistant

CONS

- Poor corrosion resistance
- Easily dented
- Must be painted inside and out

VINYL \$400 to \$1200

The market for vinyl patio doors has grown steadily through the years, owing mostly to vinyl's affordability and minimal maintenance. Vinyl doors are generally sliders; the reinforcing steel needed for swinging doors makes them less affordable.

PROS

- Inexpensive
- Minimal maintenance
- Rot and insect resistant

CONS

- Can soften in hot climates
- Few color options
- Hinged versions require costly reinforcement

WOOD \$700 to \$2400

Wood doors are appropriate for almost all residential styles. The big downside is having to protect the exterior from the effects of weather. Fortunately, most wood patio doors have vinyl, fiberglass, or aluminum skins (cladding) that protect the exterior.

PROS

- Most people find wood doors attractive
- Available in infinite styles
- Modern claddings mean less maintenance

CONS

- Most expensive
- Unclad models require regular maintenance
- Temperature and humidity can affect operation



DOOR OR FOLD-AWAY WALL?

The newest style of door includes multiple sliding or folding panels. These doors are especially popular in warm climates because they allow a seamless transition between indoor and outdoor living spaces. They operate with either folding or sliding hardware and can be used with openings of almost any width by increasing or decreasing the number of panels.

Seamless transition. When the weather is good, the four folding panels on this patio door from NanaWall can be pushed to the side, allowing the indoor and outdoor living spaces to flow together. For everyday use when the folding panels are closed, the single hinged patio door on the right provides access to the outdoors with minimal effort.



piece of information on the NFRC label is solar heat-gain coefficient (SHGC), which measures how much solar heat the glass admits. Cold-climate homes should have doors with an SHGC of 0.39 or higher. Warm-climate homes will be more comfortable with doors rated at 0.30 or lower, especially on unshaded western elevations.

When checking the SHGC and the U-factor, make sure the rating label features the “NFRC certified” stamp to ensure that the measurements given are for the whole door, including glazing, frame, and spacers, and not just the center of the glass. Center-of-glass measurements can make a door appear more efficient than it is.

Locks and screens matter, too

Multipoint locks that activate additional latches in addition to the conventional latch at the handle are also an important feature on patio doors. These additional locking points boost security and weathertightness. If you’re installing a sliding door, Todd Kippel of ThermaTru also suggests intermediate bolts that allow some ventilation by locking the door in a partially open position without providing enough room for entry.

Finally, it’s a good idea to look at the quality of the screen doors. The best sliding screens have sturdy heavy-gauge frames that resist flexing and ball-bearing rollers that make sliding easy. Hinged screens, which are found on some hinged patio doors, should have sturdy frames and be easy to prop open so that you can move in and out of the house easily with food or furniture cushions. □

Patrick McCombe is an associate editor.



Fit for a Passive House

Most patio doors perform much better than the doors of even 10 years ago, but for Passive Houses and other homes where airtightness and weathertightness are taken to the highest level, only a few high-performance products from Europe, the United States, and Canada make the grade. These high-performance doors have triple glazing and precision hardware that can bring U-factors down to 0.15. They’re made either from thermally broken wood frames or reinforced-vinyl or fiberglass frames. The downside to these good-looking precision products is price; they cost three or four times what a more conventional patio door would cost.

Triple glazing and tough frames. This superefficient patio door from Themotech Fiberglass has three layers of glass, triple weatherstripping, and a multipoint lock. Prices start at \$3500 for a single 3-ft.-wide, 6-ft.-8-in.-tall door.