

A man in a blue tank top and jeans is kneeling on a carpet, using a tool to install it. The background shows a window with a view of the outdoors.

No-Callback Carpet Installation

To avoid problems, use the right pad, watch the job-site temperature during installation, and pay attention to seam placement

Carpeting is one of the last items to be installed in a new home or remodel and an indication that the job's winding down. In all likelihood, you've

by Dave Holbrook

hired the installation out, so you don't have to worry about the how-tos, or force yourself to slow down and do things right. Contractors have bigger fish to fry. But if you haven't set the job up correctly, prior to the installer's visit, carpeting can spell trouble. If you don't like paying for mistakes, there are a number of preparatory steps to cover before they're, well, covered for

good. Common customer complaints include visible or ridging carpet seams, unfastened edges, shading irregularities, shedding, pulled fibers, wrinkling, scuffed baseboards, squeaking floors, and telegraphing floor irregularities. Some of these problems can be laid at the installer's feet — but not all of them. The more you do to set the job up properly, the better the outcome is likely to be.

Installation Prep

It's a good idea to preview existing conditions with the installer and make a record of any damage to paint, walls, and other finishes

before carpet installation begins.

The floor in any rooms receiving new carpeting should be vacuum-clean. If you're replacing old carpeting, vacuum it first, before removal, to reduce the release of airborne contaminants (see "Carpet Emissions," below). While other flooring types might require removal or a layer of new underlayment, cushion and carpet can usually be run directly over existing wood, ceramic or composition tile, concrete slabs, or a new plywood subfloor. The condition of the subfloor is important, however; an uneven surface will show right through the carpet. Remove loose materials and fill surface defects such

as chipped tiles or gapped flooring with a leveling compound or other secure replacement material.

Although glue-down carpeting is less common in residential applications, basement and porch installations are often glued. Commercial carpet tile is always glued. Make sure concrete slabs have been cured and are clean, dry, and free of dust and any curing agents that might interfere with an adhesive bond. A small amount of moisture (maximum 3 pounds per 1,000 square feet per 24 hours) wicking through the concrete is permissible, but excess moisture will interfere with a proper adhesive bond.

Stretch-in carpet should always be

Carpet Emissions: Fact & Fiction

Most people have heard allegations of allergic reactions to carpet off-gassing, or emissions. If these were substantiated, the problem would be huge; the annual residential market alone accounts for 12 billion square feet of carpet, or around 75% of the installed volume. The Carpet and Rug Institute (CRI) states that "off-gassing" is a misnomer and argues that carpet is one of the lowest emitters of volatile organic compounds (VOCs) in the indoor environment. This position is essentially supported by the U.S. Environmental Protection Agency. Carpet is made of the same natural and synthetic materials found in clothing and other everyday fabrics. Formaldehyde is not used in the carpet manufacturing process in the U.S. It may occasionally be detected in old carpeting, having been absorbed from other sources within the indoor environment. According to CRI research, new carpet's emissions will dissipate to an undetectable level within 48 to 72 hours.

To minimize complaints, CRI counsels installers to observe the following guidelines:

- Vacuum the old carpet before removal to minimize the amount of dust particles.
- Vacuum the floor immediately after the old carpet and cushion have been removed.
- Open windows and doors, if possible, for an adequate supply of fresh air. Consider using window fans, exhaust fans, room air-conditioning units, or other means for fresh air ventilation during the removal of old carpet and the installation of the new carpet.
- Continue operating the ventilation system at normal room temperature for 48 to 72 hours after installation.

If possible, leave doors and windows open to increase the flow of fresh air.

- If the carpet is to be glued to the floor, use a low-emitting floor covering adhesive displaying the CRI Indoor Air Quality Adhesive Testing Program label that identifies tested, low-emitting products.
- If any occupants consider themselves to be unusually sensitive, they may wish to avoid the area or leave the premises while the old carpet is being removed and the new carpet installed.
- If possible, unroll the new carpet in a well-ventilated area for a day or so before installation.

When it's kept clean, carpeting acts like a big filter, preventing dust and dirt from becoming airborne. Vacuuming the carpet should be a weekly chore and is not a job for a wimpy vacuum cleaner. A powerful vacuum, preferably one with a rotating beater brush, is a carpet's best friend. The CRI independently and randomly obtains and tests vacuum cleaners' ability to satisfactorily remove and contain a predetermined amount of dirt from a standard test carpet in four passes. Vacuum cleaners that pass this test receive the CRI's IAQ (indoor air quality) label. Your clients can check their machine's credentials via the CRI's consumer number or website (see page 7). Incidentally, despite the availability of DIY extraction-type carpet shampoos, carpet should be shampooed (preferably by a professional using professional equipment) only every 12 to 24 months. Repeated wetting can break down the acrylic bonding agent and dramatically shorten the carpet's service life.

—D.H.

power-stretched, using a telescoping mechanical stretching tool braced against a “power wall” — any partition that will provide resistance in the opposite direction of the stretch. Sometimes installers find that interior partitions have only been tacked in place and give way during stretching. It’s a little late and a little embarrassing to have to secure walls when you’re at the carpet stage, so make sure the bottom plates are properly nailed off before drywall.

Doors. Threshold transitions call for consideration. Installers try to avoid seaming across a door opening because foot traffic tends to highlight a seam. If the carpet will be of another color or pattern at this juncture, it may not be an issue; otherwise, a wood threshold provides a nice-looking transition. Door clearance can be a problem, especially in remodel situations. Depending on carpet thickness, you may need as much as an inch or more clearance above the subfloor. Mark the doors in place for trimming as necessary, and remove them before carpet installation.

Bifold-door hardware usually requires a floor mounting block at the hinge jambs. It’s best to install these before carpeting — the installer can easily fit the carpet around the blocks.

Terminating the carpet at a finished wood ground tends to look neater than an elaborate wrap at the base of a balustrade or stair railing (see Figure 1). Carpet installation is also simplified by this approach, saving labor.

Plan on Seams

If your clients haven’t already participated in the selection and planning process, make sure they understand that seams show and have them approve the seam locations. Manufacturers plainly state that there are no invisible seams. As part of the measuring process, the installer typically draws a detailed installation plan that shows area dimensions and proposed seams. The carpeting supplier relies on this plan to precut rolls to the appropriate lengths. To make them less obvious, seams should run perpendicular to windows



Figure 1. Finished wood thresholds and grounds at balustrades and stair railings provide a neat transition and involve less carpet installation labor.

that let in a lot of sunlight. Your customers should also understand that the degree to which a seam is visible depends on carpet style and quality. Heavily textured loop tufting often doesn’t align in strict, straight rows. If the seam cut bisects a tuft, loose strands will pull free and highlight the seam. If the seam cut is forced to follow an irregular tuft row, exact alignment with the secondary carpet section will be impossible and the seam will be more pronounced. Seams can be particularly difficult to conceal in berber carpet, a popular style with a pronounced texture and informal appearance. The least visible seams are typically in dense-pile, cut-loop, plush carpeting (Figure 2).

Measuring for carpet. Professional installers take pattern repeats, seam placement, room irregularities, closets, and stairways into account when measuring. To come up with a rough quantity for an allowance or estimate, multiply the room’s length by its width, and add about 10% to account for jogs and pattern matching. Carpeting is available in 12-foot- and 15-foot-wide rolls. Keep in mind that seams should always be made edge to



Figure 2. The visibility of a carpet seam depends on many factors, including the type and regularity of the face tufting. Irregular tufting rows force seam cuts to wander, making a true edge match impossible. Textured, berber styles are notoriously difficult to seam.

Figure 3. Rebonded urethane foam cushion, made from recycled foam sections, is rated in pounds per cubic foot of density. The denser the foam, the better the “feel” and durability underfoot.



Figure 4. Synthetic felt cushion, made from recycled carpet textile fibers, gives a firm feel underfoot and is typically applied under berber and dense, low-nap, or commercial-style carpeting. Because of its better “breathability,” it’s a good choice for potentially damp concrete basement floors.



Figure 5. Fiber density is the key to a durable carpet — generally, the more yarn stitches, or loops, per inch, the better the carpet will wear. Less dense material works best in bedrooms, dens, and other low-traffic areas.

edge or end to end. A right-angle turn in the run of the roll will cause the twist in the face yarn to catch the light differently and appear as an improper color match.

Cushion First

It’s nearly impossible to wear out a carpet’s synthetic face fibers. Carpet is often replaced, not because it’s worn out, but because the pile has become crushed and ugly. Although carpeting can be installed directly over a bare floor, industry studies suggest that the appropriate cushion can greatly extend its useful life. Carpet cushion absorbs most of the impact from traffic, preventing distortion of the carpet’s surface. Equally important to the consumer, cushioning adds a luxurious “feel” and give to the carpet.

Carpet manufacturers provide specific cushion recommendations for the various styles of carpet made. For residential use, cushion applications are divided into two service classes. Class I includes light- and moderate-traffic areas, such as living rooms, dining rooms, and bedrooms. Class II covers high-traffic areas like entries, hallways and corridors, and all stairways. You should always install the appropriate cushion for the type of service expected. Regardless of carpet type, the cushion should never be thicker than $\frac{7}{16}$ inch; a thicker cushion may “bounce” the carpet backing free from the tack row. Generally, a low-nap or loop carpet should be installed over a $\frac{3}{8}$ -inch-thick cushion, with the marginally thicker $\frac{7}{16}$ -inch cushion reserved for plush and deep-pile carpets. Keep the less ambulatory population in mind, too: Walking and wheelchair use are both impeded by a too-thick cushion.

Cushion seams should be installed at right angles to carpet seam direction. Where this isn’t possible, cushion and carpet seams should be offset by a minimum of six inches.

Cushion types. Urethane foam is probably the most commonly used carpet cushion in residential installations and is defined in pounds per cubic foot

of density, typically ranging from 4 to 12 ppf (Figure 3). Four-pound rebond cushion is an entry-level, fast-and-dirty cushion and should not be considered for a quality residential installation. Eight-pound rebond is the best cushion to use in common traffic areas under plush styles and some berbers. This cushion is softer than felt but firmer than six-pound rebond, which, when installed under plush styles, enhances their soft feel. Rubberized jute or synthetic felt, made from new carpet waste fiber, is often installed under berber and commercial styles, and gives a firm feel underfoot (Figure 4). Jute and felt are also good choices for basement slab installations, where moisture may be a concern, because an open fiber mat allows moisture to pass through more readily than a foam cushion.

Choosing a Carpet

Tufted carpeting, which accounts for 90% of all carpeting produced, is made up of three layers. The tufting, or face yarn, is stitched onto a primary backing, usually woven, of slit-film polypropylene fabric. A secondary backing sheet of woven scrim polypropylene mesh or non-woven polyester is bonded to the primary backing with liquid synthetic acrylic (latex) or occasionally other types of compound adhesives and extenders. (Natural latex is used only on small, washable rugs.) The secondary backing gives the carpet a firm “hand” and the necessary dimensional stability for stretch-attachment to the perimeter tack row.

The face yarn, or tufting, may be cut pile, loop pile, or a combination of the two. Carpet fiber is made from any one, or a blend of, six basic materials: the four synthetics — nylon, olefin, polyester, and acrylic — and wool and cotton. Ninety-nine percent of all carpet is made from synthetic fiber, with nylon accounting for 67% of the pie. Nylon is regarded as the most durable fiber and is available in all carpet styles. Olefin has high stain- and fade-resistant characteristics, as well as good moisture resistance. Most often used in commer-

cial carpeting, it's a good choice for kitchens and bathrooms, sunrooms, and damp-prone basements. Polyester has great stain and fade resistance but is a less durable material than nylon and olefin. It's ideal for children's rooms, where frequent spills and challenging stains are likely. Acrylic is most commonly found in small area rugs, such as bath mats.

Wool represents less than 1% of all carpeting but has a luxurious feel and good durability. Generally, wool is considerably more expensive than synthetic fibers. Cotton is typically reserved for loose-laid area rugs.

Best choices. Carpet quality is determined by fiber type and the density of the weave; the more yarn stitches, or loops, per square inch, the more durable the carpet and the better it will wear (Figure 5). Heavy traffic areas, such as the family room, hallways, and stairs, warrant the best, or densest, carpet the budget will allow. Less dense carpet is a good choice for a bedroom or home office, where traffic is relatively light. Manufacturers make matching lines of carpet in various densities, so that a lower-cost carpet in the bedroom will blend “seamlessly” with the higher-performance carpet in the hallway.

Walk this way. Carpet can and should be chosen to minimize the appearance of fiber crushing. Carpet fibers in the traffic areas are not usually worn away but become permanently deformed by repeated impact. Short, dense, cut- or loop-pile carpet, often seen in commercial spaces, is best for disguising high-traffic walkways. Berber and sisal-style carpets, with their textured surfaces and tight loops, are particularly effective at concealing walkways and furniture marks, without presenting a “commercial” look in a residential setting.

Performance guidelines. Manufacturers employ a performance rating system to direct carpet selection. The system varies from one maker to the next. Usually, it's based on a five-point scale, with 4 or 5 designating carpet that's best for use in high-wear areas (Figure 6). In a

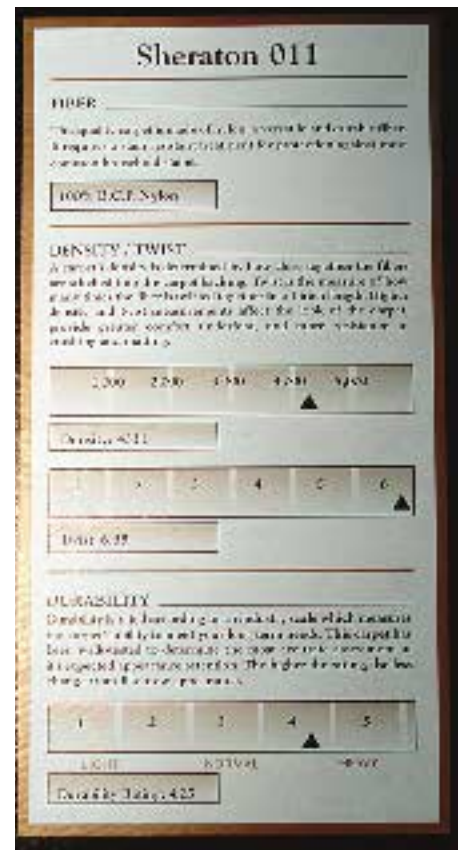


Figure 6. Consumer information is listed on the back of most carpet samples, offering application guidelines on a numerical scale, usually from 1 to 5. Higher numbers connote heavier-duty materials.

Figure 7. To improve the tack row's grip on the carpet backing, many installers prefer 2-inch-wide strips, which provide an additional row of barbs.



Figure 8. Although kick-in tools are essential to carpet installation, industry guidelines state that final power-stretching is mandatory to sufficiently stretch the carpet. Installer's knee problems eventually bring them painfully into compliance.

ten-point system, 8 to 10 will be the highest performance rating.

Installation

Stretched carpet is held in place by catching the carpet backing on the sharp, opposing barbs of a perimeter tack row. Normal 1-inch-wide tack row doesn't always hold carpet securely, so some installers are switching to 2-inch-wide tack row, which provides an additional row of barbs to securely snag the backing (Figure 7).

Look for trouble. Before installation, it's a good idea to look for color defects or variation, missing or pulled pile loops, pole damage from forklift handling, crush lines from improper storage, and any other abnormalities. To avoid permanent creasing, carpet should be stored in rolls; it should never be folded, other than brief buckling to move it into the installation site.

Cold call. The vast majority of callbacks on carpet installation jobs are due to puckered or wrinkled carpeting. Although easily corrected, it's also easily avoided with proper preparation and installation. The room in which the carpet is installed should be maintained at a temperature no lower than 65°F to 70°F, at least 24 hours prior to installation. Relative humidity should be between 10% and 65%. The carpeting should be unrolled, laid out in the room, and allowed to acclimate for at least 24 hours before it's stretched. Little time is lost to a proper installation; the carpet can be rough-fitted while acclimating, then seamed, stretched, and finished the following day. What you're trying to avoid is stretching a cold carpet in a cold room. When the heat's turned on, the warmed backing will expand and relax, resulting in a loose, wrinkled carpet.

Admittedly, this is a tall order on a simple carpet replacement job. Homeowners who have just crammed all their furniture into the bathroom or out on the deck typically want the installer in and out in a day. Acclimating materials isn't on the schedule. However, some suppliers will accommodate this snag by cutting and

acclimating the carpet lengths for the job in their heated warehouse, allowing the installer to pick up the rolls just prior to installation.

Power-stretching the carpet, rather than using the older technique of “kicking-in,” is essential to thoroughly extend and tension the backing material. You should insist that your installer observe this step. In time, most installers find that power-stretching is also crucial to the long-term preservation of their knees, which aren’t designed for the impact that kicking-in entails (Figure 8). Not surprisingly, many younger installers admit to skipping the power-stretch step, relying only on the kick-in tool and eternal youth to (inadequately) stretch the carpet.

Because seam tape doesn’t stretch with the carpet, seamed edges should be stretched prior to taping. Seams should also be treated with a liquid seam sealer before taping, to prevent tufts from breaking out of the cut edge. This step is often ignored, but loose and missing tufts loudly signal a seam’s presence. Some carpet types — some berbers, for example — are more prone to seam “peaking” than others. Replacing the standard three-inch-wide seam tape with six-inch tape helps prevent peaking. Certain installers ignore this precaution, simply because they don’t own a six-inch seaming iron.

Glue-Down

More common in commercial installations than residential applications, glued-down carpeting eliminates wrinkling concerns, peaking seams, and the need for a perimeter tack row. Gluing the carpet secures the entire field against displacement under heavy use. The double-stick method, which involves first bonding a carpet cushion to the substrate, then bonding the carpet to the cushion, is the most durable installation. Cushion-backed carpet enjoyed a brief run of popularity, but, apparently, the backing tends to break down irregularly under use, marring the surface appearance.

Removing a glued-down carpet isn’t

particularly difficult, at least after you’ve gotten an edge started. Occasionally, wood fibers from the top lamination of a plywood underlayment will tear up with the carpet. To control this tendency, and to make disposal easier, it’s best to slice the carpet into foot-wide strips before removal.

Resist asking your installer to stretch new carpeting directly over an old glue-down job. Industry standards advise against this practice, because the friction of the old carpet pile will inhibit effective stretching. Plus, the old pile will flex underfoot and unevenly stretch the new carpet, creating “bubbles” in the surface.

Carpet and Radiant Floors


Carpet and cushion combined have considerable insulating properties, with R-values up to 2, which may make carpet a marginal choice over a radiant floor. Although inconclusive, certain tests also suggest that when heated, carpet fibers produce chemical emissions. If your clients insist on carpeting their radiant floor, it’s a good idea to make sure that the home has a means of supplying a constant fresh air change to avoid possible odor or air-quality complaints. According to a recent article in *Radiant Panel Report*, a thin, dense rubber pad is best over radiant heat because it’s relatively conductive and more resistant to heat degradation. Wool carpeting is 1½ times more insulating than synthetic fiber; the best choice is any thin, synthetic berber or commercial-type carpet. Ironically, radiant heat provides one of the very things carpeting is chosen for, that is, a warm feel underfoot. On a radiant floor, the best carpet is no carpet.

Unavoidable Problems

One 25-year veteran installer jokingly comments that he used to encourage party-goers to drop their cigarettes on the host’s carpet for “job security.” A spilled glass of red wine can be equally effective. Whatever the source, small burn holes and permanent stains are simple to repair, especially when installation remnants have been retained and

stored by the homeowner. The burned or stained area is cut out and a matching carpet patch inlaid and secured with hot-melt seam tape. In a pinch, the installer can “borrow” a patch from a closet or other inconspicuous area and replace it with a compatible or non-matching remnant.

Many carpets undergo a stain-resistance treatment at the factory, and manufacturers offer warranties against staining by certain common foodstuffs. Specific exclusions apply, particularly to kitchen and bathroom installations, and to certain stain sources like pets and abuse.

Heads up. Carpet suppliers and showrooms often post noteworthy style-specific characteristics and cautions on their sample boards, such as “Difficult to seam” and “Can’t be edge bound.” It’s a good idea to inquire about any peculiarities common to the carpet being selected. 

Dave Holbrook is an associate editor at The Journal of Light Construction. Thanks to Ross McDonald of McDonald Installation Systems and Barbara Karras of Cloutier Supply Company, who assisted with this article.

For More Information

Carpet & Rug Institute
800/882-8846
www.carpet-rug.com

Carpet Cushion Council
203/637-1312
www.carpetcushion.org

International Certified Floorcovering Installers Association
816/231-4646
www.CFI-Installers.org