

**STANDARD**  
**For INSTALLATION SPECIFICATION of**  
**COMMERCIAL CARPET**

**CRI 104 - 2002**

# Tenth Edition

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## DISCLAIMER

The Carpet and Rug Institute assumes no responsibility and accepts no liability for the application of the principles or techniques contained in this standard. Specifying authorities are responsible for reviewing applicable federal, state, and local statutes, ordinances, and regulations, including mandatory requirements contained in the Occupational Safety and Health Administration (OSHA) Hazard Communication Regulation.

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## FOREWORD

This standard for installation of commercial carpet is based upon reliable principles and procedures developed through practical experience, research, and information obtained from manufacturers, retailers, installers, end users, testing laboratories, and others who have specialized expertise.

This standard does not include carpet performance characteristics. For guidance in selecting and specifying carpet, review appropriate publications developed by The Carpet and Rug Institute.

Throughout this document the general terms “must,” “highly recommended” and “recommended” are used to compare and contrast the different levels of importance attached to certain practices.

When the term *must* is used in this document, it means that the practice or procedure is required or mandatory.

When the term *highly recommended* is used in this document, it means that the practice or procedure is the generally accepted method to be followed.

When the term *recommended* is used in this document, it means that the practice or procedure is advised or suggested.

Failure to follow this standard for installation must not be the basis for rejecting a claim relating to a manufacturing defect, unless the failure to do so contributed to or caused the defect.

Every carpet has unique characteristics and each carpet installation project should be carefully evaluated to determine proper application of this standard. In extenuating circumstances, contact the product manufacturer for specific guidance. Carelessness is never acceptable and common sense should prevail in all cases. The CRI highly recommends that the services of professionally trained and qualified floor covering contractors be obtained for all commercial carpet installations.

The Carpet and Rug Institute (CRI) is the national trade association of carpet and rug manufacturers and suppliers to the industry. The expertise of the Carpet and Rug Institute’s membership comes together to provide unbiased technical, educational and scientific information about carpet and rugs.

## Acknowledgements

This Standard was prepared under the direction of the Installation Subcommittee of the Carpet and Rug Institute and in cooperation with numerous experts in the carpet installation and related fields.

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# **Standard For Installation Specification of Commercial Carpet CRI-104 - 2002**

## **1. Scope**

This document establishes minimum industry standards for commercial carpet installation.

## **2. Applicable Documents and References**

### **2.1 Carpet and Rug Institute References:**

- *Standard for Installation of Residential Carpet\** - CRI 105 -2002
- *The Carpet Primer* \*
- *Excellence in Action – Principles of CRI-105 in Video*
- *Characteristics of Patterned Carpet Technical Bulletin\**

\* Downloadable from The Carpet and Rug Institute web site [www.carpet-rug.com](http://www.carpet-rug.com)

### **2.2 ASTM Standards:**

- ASTM F-1869-98 – *Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Calcium Chloride*,
- ASTM F-710-98 – *Standard Practice for Preparing Concrete to Receive Resilient Flooring* - American Society of Testing & Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. [www.astm.org](http://www.astm.org)

### **2.3 IICRC S100, Standard and Reference Guide for Professional Carpet Cleaning.** Institute of Inspection, Cleaning and Restoration Certification (IICRC) [www.iicrc.org](http://www.iicrc.org)

## **3. Terminology**

For definitions used in this standard, refer to the *Definitions of Terms* section in the appendix of this document.

## 4. Tools and Materials

Carpet must be installed using tools and materials referenced in this standard. Proper tools and quality materials are essential for skilled and proficient carpet installation.

## 5. Storage and Handling

**5.1 Storage** – Carpet and related materials must be stored in a climate-controlled, dry space. Carpet must be adequately protected from soil, dust, moisture and other contaminants and stored on a flat surface. Stacking heavy objects on top of carpet rolls or stacking more than three rolls must be avoided.

**5.2 Handling** – Carpet must be transported in a manner that prevents damage and distortion. Bending or folding individual carpet rolls is not recommended. When bending or folding is unavoidable for delivery purposes, the carpet should be unrolled and allowed to lie flat immediately upon arrival at the installation site.

**CAUTION: Failure to observe the preceding requirements may result in the following:**

- 1) Contamination from soil, grease and/or oil
- 2) Delamination
- 3) Dimensional changes
- 4) Permanent indentation
- 5) Development of wrinkles and bubbles
- 6) Pile reversal
- 7) Roll-crushing
- 8) Creases
- 9) Pattern distortion

## 6. Planning

All facets of the installation are to be coordinated. A scale drawing of the area to be installed is required to determine carpet quantities, quantity per dye lot, edge treatments, cushions, adhesives, moldings and other accessories, and to identify the proper location of seams.

On new construction, architectural drawings must be provided that define the entire installation area with space names or numbers and a finish schedule of flooring style, patterns, colors and installation methods. On existing structures, new measurements and shop drawings must be made.

**6.1 Shop Drawings** - The carpet shop drawing must contain the following information:

- Name of the job, owner and installation company. On new construction the name of the general contractor and architectural firm must be listed.
- Building address
- Date of drawing
- Scale
- Floor number and location in building
- Compass direction on each sheet
- Drawing for each area to be carpeted (color coding is preferable)
- Construction of subfloor for each area
- Type of installation for each area
- Quantities of carpet needed for each area, including roll length requirements and manufacturer installation sequencing
- Exact notations where dye lot changes occur
- Excess material in each area and how it is to be used
- Seam layout of each area
- Carpet pile direction for each area
- Name of manufacturer, style, backing system and color of carpet for each area
- Large scale drawings showing treatment of step areas or other detail work
- Location and type of expansion joints and edge moldings
- Type of wall base in each area.

**6.2 Planning for Seams** - Seams must be kept to a minimum. Seams must be positioned so that, where possible:

- they run the length of the area.
- main traffic flow runs along, rather than across, the seam.
- natural light does not strike across the seam.
- are away from areas subject to pivoting traffic.
- are not perpendicular to doorway openings.

**6.3 Unprotected Edges** - At the transition between carpet and other floor coverings, carpet edges must be protected and covered with appropriate molding. In transition areas, the edge of the hard surface flooring must be a minimum of 1/16" higher than the carpeted flooring. Seam sealer must be applied to the edge of the carpet at the transition area.

**6.4 Carpet Over Expansion Joints** – Do not install carpet over expansion joints. Expansion joints allow separate floor surfaces to expand and contract independently. In addition, do not install on any area of a floor that does not provide a stable and mechanically sound surface. This does not include cut or saw joints within a section of the floor. Non-stable/unsound substrate joint conditions must be handled in strict accordance with the appropriate architectural drawing. If no expansion joint device is specified on the drawing, the building owner, or owner's representative, must be made aware that failure to address expansion joints may result in installation failure, damage to the carpet and potential safety concerns.



**6.5 Wallbase** - When vinyl or rubber wall base is used in a carpet adhesive installation, cove base or base-with-toe is highly recommended.

**6.6 Pile Direction** - Where two or more pieces of the same carpet are adjacent, the pile direction must be the same unless otherwise specified. Uniform pile direction is not required with dissimilar carpet.

**Note:** Ideally, install carpet with the pile lay toward the entrance; but other factors, such as pattern, aesthetics and economic use of material may be considered.

**6.7 Pattern Matching** – Refer to Section 15. Consult the manufacturer for specific installation requirements and possible warranty conditions. See the CRI Technical Bulletin, “*Characteristics of Patterned Carpet,*” for additional information.

## **7. Site Conditions – All Installations**

**7.1 Subfloor Conditions** – The owner or general contractor is responsible for providing an acceptable substrate for the specified installation.

**Note:** Installing carpet prematurely before other trades have completed their work often results in problems including: appearance retention, visible damage, soiling, adhesive failure, delamination and dimensional stability. These conditions may not be immediately evident.

**7.2 Temperature and Humidity** – Carpet must be installed when the indoor temperature is between 65-95°F (18-35°C) with a maximum relative humidity of 65%. If ambient temperatures are outside these parameters, the installation must not begin until the HVAC system is operational and these conditions are maintained at least 48 hours before, during and 72 hours after completion.

**7.3 Floor Preparation** - Carpet must be installed over properly prepared substrates that are suitable for the specific product and installation method selected. All cracks, holes and flooring irregularities must be adequately repaired to ensure a smooth, finished appearance and prevent accelerated wear. Subfloors must be structurally sound and free of foreign substances that might compromise the carpet or its installation. Patching compounds must be suitable for the use application. They must be polymer-fortified and applied according to the patch manufacturer’s instructions.

**Note:** Patched areas may be porous and highly alkaline, which may prevent adequate adhesive bond. For best results patched areas should be primed.

**7.4 Concrete** - Concrete must be cured, clean and dry. Cracks, chips and joints must be properly patched or repaired.

- 7.4.1 Stretch-in Installations** – It is highly recommended that the owner or general contractor have the concrete subfloor tested to determine the moisture emission rate and surface pH prior to installation
- 7.4.2 Adhesive Installations** - The owner or general contractor must have concrete subfloors tested to determine the moisture emission rate and surface pH prior to installation. (See Section 7.10 )

**CAUTION:** Any concrete floor, even when adequately cured and dry, can allow moisture vapor to pass through to its surface. Depending upon the type of carpet and method of installation, the moisture emission rate greatly influences the long-term success of an installation. The use of a properly installed, uncompromised, approved moisture membrane is essential in preventing moisture migration into and through a concrete slab. (Ref. ASTM F 710)

- 7.5 Wood** - Wood subfloors must be structurally sound. Subflooring, such as plywood, hardwood, particleboard, oriented strand board, or other materials, must be flooring grade and installed to manufacturer specifications. Cracks, chips and joints must be properly patched and prepared.
- 7.6 Metal** - Metal floors must create a smooth, even plane, and be cleaned of grease, oil, soil and rust. Metal or raised flooring must be structurally sound and properly secured.

**Note:** Adhesives applied to bare metal surfaces can cause rapid oxidation or other chemical reactions. Bare aluminum must be sanded prior to adhesive application to remove oxidization.

- 7.7 Resilient Flooring** – Installing carpet over resilient flooring may be acceptable as long as the resilient flooring is securely bonded to the substrate. Refer to section 9.2.3 for additional information on direct-glue down installations.

**Note:** Installing a second layer of finish flooring material, including some carpet types, can trap moisture and result in widespread failure, even over subfloors that previously had never shown signs of moisture or moisture-related problems.

**CAUTION:** Some sheet vinyl, resilient tile and cut-back asphalt-based adhesive may contain asbestos and/or crystalline silica. Inhaling dusts from these materials creates a cancer and respiratory system hazard. **Lacking documented evidence to the contrary, e.g., current testing, assume that these materials contain asbestos and treat them in the manner prescribed for removing floors containing asbestos.** Recommended work practices prohibit sanding, dry scraping, bead-blasting or mechanically pulverizing resilient flooring, backing or lining felt. Do not use powered devices that create asbestos dust when removing “cut-back” or asphalt-based adhesives. Removal procedures must comply with federal, state and local government agency regulations covering the removal and disposal of asbestos-containing materials (ACM).

- 7.8 Carpet Over Carpet** - Carpet must not be installed over existing carpet, unless manufacturer recommendations specify otherwise. In carpet-over-carpet installations, sub-surface carpet must be clean and dry according to the IICRC S100 Standard before installation is accomplished.

**7.9 Radiant-heated Floors** – Radiant-heated floors require special consideration in the selection of carpet, carpet cushion, installation methods and adhesive.

**7.9.1** Unless absolutely certain about the location and depth of heating components, attach tackstrip and moldings using adhesive.

**7.9.2** The maximum surface temperature of radiant-heated subflooring must not exceed 85°F/29°C.

**7.10 Testing Concrete Subfloors** - Before making an adhesive-adhered installation, the owner or general contractor, or their designated testing agent, must submit to the flooring contractor a written report on the vapor emission levels and the surface alkalinity of concrete subflooring. Testing must conform to ASTM standards.

**Note:** It is recommended that qualified independent testing agencies be used for determining vapor emissions and alkalinity in the floor surface. Testing by an independent specialist to determine installation suitability is a prudent and necessary safeguard for general contractors, owners, architects, flooring products providers and installation contractors. As a minimum, testing agencies or individuals must demonstrate verifiable experience in vapor emission testing or be certified by recognized organizations, such as the Institute of Inspection, Cleaning and Restoration Certification (IICRC) or the equivalent.

**7.10.1 Moisture Vapor Emissions Testing** - Concrete floors, even with adequate curing time, can present an unacceptable moisture condition by allowing excessive amounts of moisture vapor to pass through to the surface. This can be a problem even on suspended concrete floors. Test all concrete floors for moisture emission rates using an anhydrous calcium chloride moisture test kit. This quantitative test method must be conducted carefully in strict compliance with ASTM Test Method F 1869. Moisture emission rate is measured in pounds of moisture over a 1000 ft<sup>2</sup> area during a 24 hour period. Because calcium chloride testing requires a minimum of 60 hours to conduct, proper installation planning is required. As a general guideline, an emission rate of 3.0 lbs. (1.4 kg) or less is acceptable unless otherwise specified by the carpet manufacturer.

**7.10.2 Testing for Alkalinity** - A pH range of 7-9 is satisfactory; however, a reading above 9 requires corrective measures. Perform testing in accordance with ASTM Standard Practice F-710; or consult the adhesive manufacturer for recommended testing and corrective procedures.

**Note:** The results obtained from testing reflect only the condition of the concrete floor at the time of testing. Further, it is highly recommended that the test site or building be at the same temperature and humidity expected during normal use. These conditions must be maintained 48 hrs prior to, and during testing.

**7.11 Relaxing/Conditioning Carpet** – To minimize wrinkling and buckling, and to facilitate installation, it is highly recommended that carpet be unrolled and allowed to relax in the installation area for a minimum of 24 hours at a temperature between 65-95°F (18 -35°C). Carpet must be adequately protected from soil, dust, moisture and other contaminants. To facilitate relaxation, pre-cutting carpet is recommended.

**7.12 Ventilation** - During installation, maintain fresh air ventilation using exhaust fans, and by operating the ventilation system at full capacity. Always exhaust air to the outside and avoid re-circulation. After installation, maintain fresh air ventilation for 48-72 hours at normal room temperatures by operating the ventilation or exhaust fan system at full capacity. Open doors and windows, if possible. These procedures help exhaust, dissipate and eliminate lingering odors from the installation.

**Note:** For acceptable indoor environmental quality, fresh air ventilation in commercial spaces must be maintained in accordance with current guidelines specified in ASHRAE Standard 62 published by the American Society of Heating, Refrigerating and Air Conditioning Engineers ([www.ashrae.org](http://www.ashrae.org)).

## **8. Carpet Seam Edge Preparation**

All edges that are used for seams must be properly prepared in strict compliance with carpet manufacturer recommendations.

**8.1 Trimming** – Carpet edges at seams must be trimmed using tools and techniques best suited for the carpet style (e.g., loop-pile, cut-pile, cut-and-loop pile). Trim edges far enough into the material to maintain the structural integrity of the carpet and to join edges without gaps or overlaps.

**Note:** Although “row-cutting” both edges is preferred, other trimming techniques may be more suitable on some carpet. Many carpets do not lend themselves to all methods of cutting. **Some woven carpet selvages must not be trimmed.** Contact carpet manufacturers for specific recommendations

**8.2 Sealing Edges** – Prior to seaming, both trimmed edges of the carpet sections to be joined must be sealed with an appropriate seam adhesive. Latex seam sealer or thermoplastic adhesives are acceptable. Seam adhesive must be applied in a manner that encapsulates both primary and secondary backings.

**CAUTION:** Failure to properly seal seam edges often results in:

- edge ravel
- edge delamination
- tuft loss
- seam separation
- safety concerns

**8.3 Proper Seam Characteristics** – With any seaming method, a properly constructed seam:

- has cleanly trimmed edges properly secured with seam sealer
- has tightly abutted edges without gaps or overlaps
- maintains reasonable pattern match where applicable
- will not be totally invisible

## **9. Direct Glue-Down Installation**

**9.1 Relaxation/Conditioning Carpet** – Refer to Section 7.11.

**9.2 Additional Subfloor Requirements** – Subfloors must be clean, dry, and with no cracks, existing adhesives and surface irregularities that might show through the finished installation or cause premature wear. The floor must be free from contaminants that may interfere with adhesion.

**CAUTION:** Carpet, when bonded with an adhesive, follows every contour of a substrate, essentially forming a skin. Seemingly insignificant imperfections in a subfloor can become very obvious after the carpet is installed. Joints, cracks, depressions and protrusions that are not on an even, level plane may be unsightly and cause premature wear. Soil, dust, wax, oil, grease, moisture and other contaminants can prevent or otherwise destroy adhesion causing localized or widespread failure.

**Note:** While some floor preparation is “normal,” it is not the floor covering installation contractor’s responsibility to correct deficiencies in the work of other tradesmen

**9.2.1 Pressure-treated Wood** – Wood that is chemically pressure-treated to alter properties relating to outdoor exposure or flame resistance may not be a suitable substrate. Floor covering adhesives could be subject to chemical degradation when applied to these surfaces; therefore, direct-glue installations on pressure-treated wood sub floors are not recommended.

**9.2.2 Painted Surfaces** - Painted surfaces may be suitable for adhesive application; however, appropriate bond tests may be required. Contact the adhesive manufacturer for recommendations. Glossy surfaces must be abraded prior to installation.

**CAUTION:** Lacking documented evidence to the contrary, e.g., current testing, assume that all paints contain lead and treat them in the manner prescribed by existing lead abatement regulations.

**9.2.3 Resilient Floor Coverings** – It is not recommended that carpet adhesive systems be used directly over existing sheet vinyl, homogeneous or laminated solid vinyl tile, and some rubber flooring products. These materials may contain vinyl plasticizers that could migrate into the carpet adhesive and loosen the bond. Contact individual

manufacturers for specific recommendations. Direct glue-down installations over vinyl asbestos tile (VAT) and/or vinyl composition tile (VCT) are acceptable as long as all tiles are tightly adhered to the substrate and all waxes, sealers, floor finishes and other foreign materials have been removed.

**9.2.4 Terrazzo, Ceramic, Marble, Slate and Other Nonporous Surfaces** - Remove surface finishes and abrade flooring surfaces to ensure adhesion. Grout lines must be filled and flush with flooring material surface. Strict attention must be given to the “open time” recommendations of the adhesive manufacturer when adhering carpet to these surfaces.

**9.2.5 Primers** –Using primers on floor surfaces generally is not required except for sanded wood sheet products, dusty, porous or acoustical concrete surfaces. Priming cannot overcome moisture vapor emissions and must not be used for that purpose. They must be compatible with adhesives, which should be applied only after the primer is cured. Where lightweight or acoustical concrete subfloor is present, refer to manufacturer recommendations for the proper installation procedure to use before the carpet is installed.

**Note:** Subfloor primers are recommended by some manufacturers for specific carpet installations to enhance adhesion.

**9.2.6 Liquid Adhesive Removers** - There are a number of liquid adhesive removers available that effectively remove existing adhesive residue from sub-floors; however, there is evidence that some products may adversely affect the new adhesive or the new floor covering. Residues left in or on the concrete slab may cause failure of the new floor adhesive.

**9.2.7 Sweeping Compounds** - These compounds may leave residue that interferes with adhesive bonding. They must not be used prior to adhesive application. Vacuum dusty areas instead.

**9.2.8 Carpet Layout** – Layout the carpet according to the seaming diagram. Carpet must be cut 3-4 inches (75-100 mm) longer than the area measurement. Where applicable, allow for pattern repeat. Align all carpet breadths to their proper position and trim seams.

### **9.3 Floor Adhesive Application**

**9.3.1 Trowel Selection** - Select the appropriate adhesive and trowel notch configuration recommended by the carpet manufacturer and/or adhesive supplier, or refer to the list shown in Table II as a minimum.

**9.3.2 Adhesive Application** - The floor adhesive must be spread uniformly over the subfloor with an appropriate trowel, leaving ridges of sufficient height to achieve full

and complete coverage of the substrate and carpet backing, including penetration into the backing's deepest recesses. Trowel notches wear down during use. Maintain a clean and properly notched trowel throughout the installation process. After sufficient open time, the carpet must be pressed into the adhesive and rolled with an appropriate roller as specified in section 9.6.

**CAUTION:** Bond failure most often is caused by:

- inadequate adhesive application from incorrect trowel notch size and/or trowel notch configuration
- improper adhesive selection or quality
- incorrect open time
- residual curing and parting compounds
- moisture-related problem
- premature traffic or cleaning before adhesives have adequately cured

**9.3.3 Open Time** – Appropriate open time varies depending upon environmental conditions, subfloor porosity, backing system and adhesive type. Refer to the adhesive and/or carpet manufacturer for recommendations regarding open time.

**9.4 Alternative Adhesive Systems** – Alternative field-applied systems, such as spray adhesive or roll-adhesive films, are available. Refer to carpet manufacturer information whether an adhesive system is acceptable.

**9.5 Seam Adhesive (“Sealer”)** - For carpet systems that require seam sealing, an appropriate direct-glue seam adhesive must be applied to the edges trimmed for seaming and cover the thickness of both the primary and secondary backing without contaminating face yarns (See Figure 1). The seam adhesive is applied to the cut edge of one side only, that side being the first one placed into the floor adhesive. When the edges are abutted to form the seam, and while the seam adhesive still is transferable, this seals the first edge as well as the second.

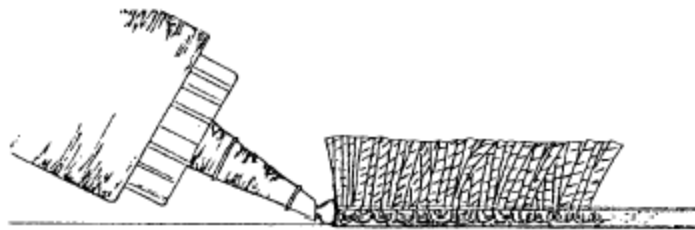


Figure 1

**9.6 Rolling** – After sufficient adhesive application and open time, the carpet must be pressed into the adhesive and rolled with an appropriate roller. Rolling must be performed with the lightest roller that achieves full and complete coverage of the substrate and carpet backing, including penetration into the backing's deepest



recesses. Refer to manufacturer recommendations for roller weight. Roll the carpet in both directions, but do not roll excessively.

- 9.7 Finishing at Wall Line** – The installation must be finished and adhered securely along the wall line with a smooth, neat appearance. It is highly recommended that carpet base, wall base with toe, baseboards or other moldings, be installed after the carpet is installed.
- 9.8 Protecting the installation** - See Section 15.

## **10. Double-Glue-Down Installation**

- 10.1 Relaxation/Conditioning Carpet** – Refer to Section 7.11. Site conditions, environmental and ventilation conditions become even more important when performing double-glue-down installations. In double-glue installations, a separate cushion is adhered to the subfloor and the carpet is glued to the cushion.

**CAUTION:** Because significant differences exist in various carpet cushions, consult with the manufacturer of the cushion, carpet and adhesive for recommendations regarding this installation method. Only materials specifically designed for this installation method may be used.

- 10.2 Preparation** – Refer to Section 6.0 and 9.0 of this Standard for floor preparation requirements.
- 10.3 Cushion installation** - Cushion must be installed in the longest continuous lengths possible with consideration to traffic patterns and carpet seam placement. Cushion seams must be at a right angle (90°) to carpet seams or offset at least six inches (150 mm). Cushion seams must be butted without compression, leaving no gaps.
- 10.4 Carpet layout** – Carpet must be cut 3-4 inches (75-100 mm) longer than the area measurement. Where applicable, allow for pattern repeat. Align all carpet breadths to their proper position and trim seams. Care must be taken to avoid cutting into cushion under seams.
- 10.5 Adhesives and Trowel Notch Sizes** - When applying cushion to floors and carpet to cushion, select the appropriate adhesive and trowel notch size recommended by the carpet, cushion and adhesive manufacturer. If recommendations are not available, refer to the general minimum guidelines in Table II. Adhesive must be spread uniformly over the cushion with the specified trowel or other application procedure. After sufficient open time, the carpet is to be pressed into the adhesive and rolled with the appropriate roller. Proper open time is critical for a successful installation.



- 10.6 Seaming** - A variety of seaming options exist. Consult the cushion and carpet manufacturer for specific recommendations.
- 10.7 Rolling** - Rolling must be performed with the lightest roller that achieves proper transfer of the adhesive into the carpet back. Refer to manufacturer recommendation for roller weight. Roll the carpet in both directions, but do not over roll.
- 10.8 Protecting the Installation** - See Section 16.
- 11. Attached-Cushion Installations**
- 11.1 Relaxing/Conditioning Carpet** – Refer to Section 7.11.
- 11.2 Carpet Layout** - Refer to Section 9.2 (Direct-Glue Installations)
- 11.3 Floor-Applied Adhesive Installations** - Use the floor adhesive and carpet seam adhesive recommended by the carpet or adhesive manufacturer. Also, refer to Table III. Special floor and seam adhesives are required for carpet with PVC backing.
- 11.3.1 Trowel Notch Size** - Refer to Table II
- 11.3.2 Open Time** - Adequate open time for adhesive must be allowed. Open time varies depending upon environmental conditions and the adhesive type.
- 11.3.3 Installation Procedures** - Seam edges must be cut with appropriate tools based on carpet manufacturer recommendations. To eliminate possible height variation at the seam, a sufficient amount of the factory edge or selvage must be trimmed. Cut edges at seams must be sealed with proper seam adhesive applied as recommended by the carpet or adhesive manufacturer. Rolling of installed carpet must be accomplished according to manufacturer recommendations.
- 11.3.4 Protecting the Installation** - Refer to Section 16
- 11.4 Pre-applied Adhesive Systems (“peel-and-stick”)** - Pressure sensitive adhesives sometimes are applied to attached-cushion backings during manufacture. Backings of this type have special floor preparation requirements. Consult the carpet manufacturer for recommended installation procedures.
- 11.5 Hook and Loop Technology** - This specialized installation system uses hooked tape, and a looped fabric to cover the entire underside of the carpet. The system

involves detailed and specific installation practices. Consult the carpet manufacturer for recommended installation procedures.

## 12. Stretch-in Installations

This method involves installing carpet under tension, using tackstrip fastened at all walls and other vertical abutments around the perimeter of the area. A separate cushion must be used.

### 12.1 Relaxing/Conditioning Carpet – Refer to Section 7.11.

**12.2 Tackstrip** –Tackstrip must be a minimum of one inch (25 mm) wide and ¼ inch (6 mm) thick. Architectural strip with three rows of pins, or two conventional strips with two rows of pins each, must be used for carpet with heavily-latexed backs, for most woven and Berber-style carpet, and for any carpet in rooms exceeding 30 feet (9 m) in length or width. To prevent possible injury to building occupants, the pins on tackstrip must not protrude through the carpet being installed.

Additional tackstrip installation specifications include:

- Tackstrip must be securely fastened to maintain the stretch provided by power stretching.
- Tackstrip must be placed with the pins angled toward the vertical abutment.
- The gully, or distance between the tackstrip and vertical abutments, must be slightly less than the thickness of the carpet but not exceed 3/8 inch (9 mm).
- Installing tackstrip across door openings and/or sills must be avoided.
- Tackstrip must be cut to follow the contour of door casings and other irregularly shaped abutments.
- Carpet must not be stapled to tackstrip.
- On radiant-heated floors, do not drive nails or screws into conduit or tubing.

**12.3 Separate Cushion Selection** –The cushion must conform to carpet manufacturer recommendations for the specific product being installed. Failure to follow these recommendations for cushion may void manufacturer warranties. These recommendations may differ, depending on the style and construction of specific carpet. **Cushion thickness for commercial carpet installations should not exceed 3/8 inch (10 mm).**

Separate carpet cushion must be installed in the longest continuous lengths possible, with cushion seams placed at right angles to carpet seams, or offset at least six inches (150 mm) to one side. Cushion must be trimmed flush with the inside contour of the tackstrip and securely fastened to the subfloor using staples or nonflammable cushion adhesive at all seams and around the perimeter of each

room. With the exception of fiber cushions, seams also must be secured with appropriate cushion tape.

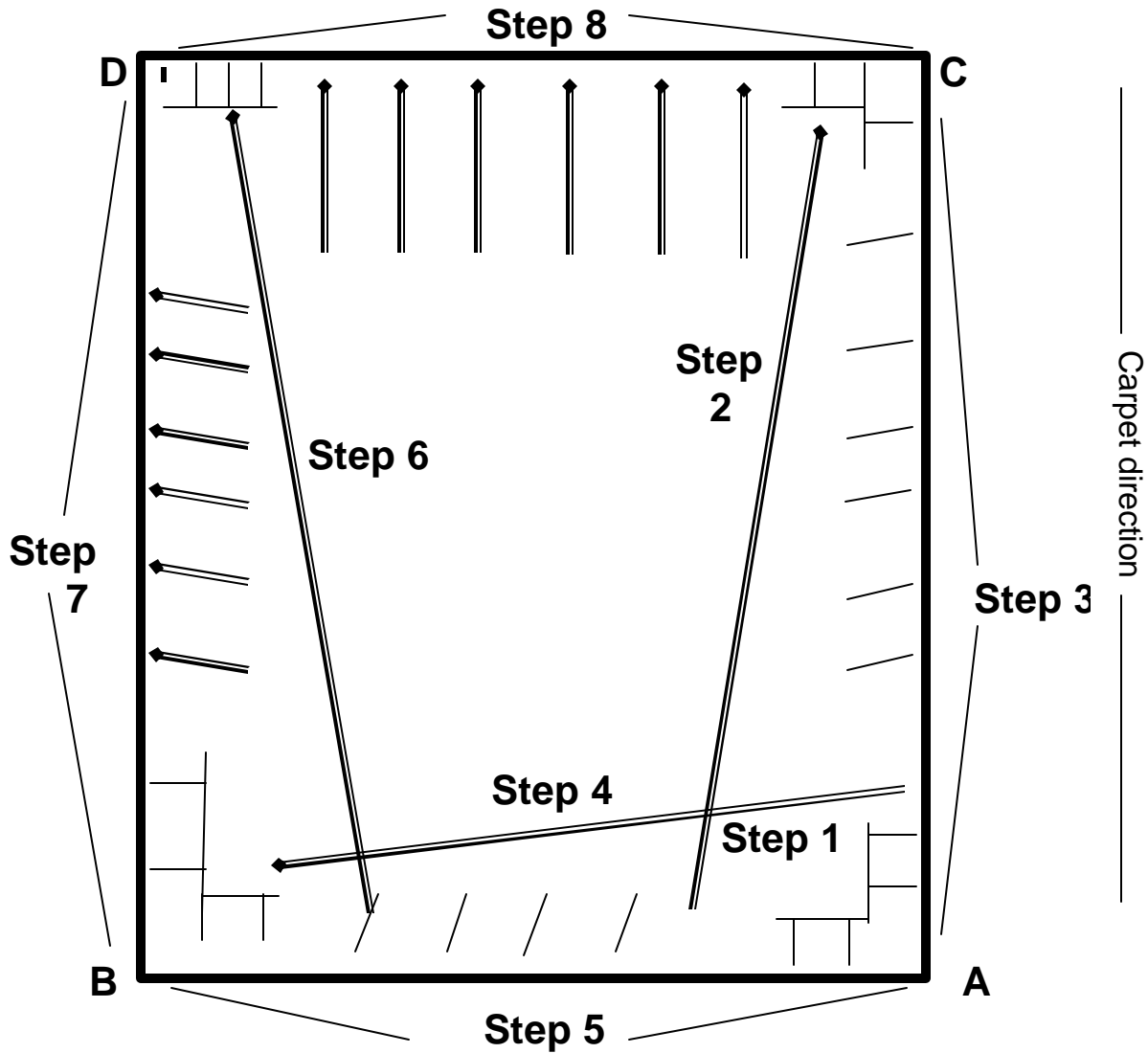
**12.4 Seaming** – The seaming method depends upon the carpet’s construction and backing type. Always follow manufacturer recommendations for seaming. Common seaming methods include:

- hot-melt tape
- hand sewing
- tape and latex
- conductive tape

**12.5 Power Stretching** – Carpet must be properly power-stretched and firmly hooked onto tackstrip following the eight-step procedure described in Figure 2.

## FIGURE 2 - Stretch Diagram for Tufted Carpet

In the absence of carpet manufacturer stretch recommendations, use the diagram below.



- Step 1 - Hook onto tackstrip, approximately three feet in both directions, along corner A.
- Step 2 - Power stretch at approximately 15° angle from wall A-B and hook onto tackstrip at corner C.
- Step 3 - Hook and secure onto tackstrip with knee kicker along wall from A to C.
- Step 4 - Power stretch at approximately 15° angle from wall A-C and hook onto tackstrip at corner B.
- Step 5 - Hook and secure onto tackstrip with knee kicker along wall from A to B.
- Step 6 - Power stretch at approximately 15° angle from wall A-B and hook onto tackstrip temporarily at corner D.
- Step 7 - Power stretch from wall A-C and hook along wall from B to D.
- Step 8 - Power stretch straight from wall A-B and hook onto tackstrip along wall from C to D.

**12.5.1 Using a Power Stretcher Is Mandatory.** Devices used as a substitute for, or an attachment to a power stretcher that penetrates through the carpet backing may cause injury, damage carpet or subfloors, or result in inadequate stretch. Such devices are not acceptable.

**CAUTION:** Failure to power stretch a carpet may result in:

- wrinkling and buckling over time
- localized damage to the carpet
- delamination

**12.5.2 Amount of Stretch** – Due to the difference in carpet backing types, manufacturer recommendations for carpet stretch must be followed. In the absence of specific recommendations, tufted carpet with synthetic backing should be stretched 1% to 1½% in length and in width.

**Note:** Slightly less stretch applied to the carpet’s width compared to its length usually lessens the tendency for seam-peaking.

**Note:** Wrinkles and buckles most often are caused by: failure to adequately stretch carpet using a power stretcher, using inappropriate cushion, adverse temperature and humidity conditions, or inadequate conditioning time.

**12.6 Finishing at Wall Line** – The installation must be finished along the wall line, leaving a smooth, neat and secure transition. Carpet must be trimmed without damaging baseboards or moldings, leaving sufficient material for backing to be securely tucked into the gully without protruding face or backing yarns.

**Note:** Minor scratching of surface finish on baseboards and moldings may be unavoidable during the tucking process.

**Note:** For patterned carpet, care must be exercised to ensure pattern alignment along walls. The use of a power stretcher, stay-nails and a “dead man” may be necessary to achieve proper pattern match at seams and alignment along walls.

**12.7 Transition Molding** – Where carpet meets other floor coverings, edges must be adequately protected with an appropriate transition molding.

**Note:** Carpet placed into transition moldings may require edge sealing to prevent raveling.

## **13. Carpet on Stairs**

**13.1 Preparation** - Stair nosing and return must be rounded  $\frac{3}{4}$  -1 inch (19 to 25 mm) to prevent sharp stair edges from cutting carpet and/or cushion, and to provide proper carpet contact for adhesive installations. When carpet is installed over a separate cushion, the cushion must extend over the stair nose.

**13.2 Stretch-in Installation** - Tackstrip is to be installed on each tread. Pins on the tread must point toward the riser. On a waterfall-type stair installation, tackstrip is to be installed on risers also. Pins on risers point down to the tread. The gully between strips must be slightly less than double the carpet thickness. Where a turned finish is desired, tackstrip and cushion are about 1½ inches (38 mm) less than the carpet width, to allow for a turn under on each side of the stairs. Some stairs require tackstrip on the sides to maintain the proper tension. When using a cap-and-band or upholstered technique, tackstrip is not used on riser.

**Note:** When staples are used in upholstering carpet on stairs, care must be taken to separate pile yarns to avoid trapping yarns, resulting in visible distortion.

**13.3 Glue-down Installation** - Carpet on stair treads and risers must be installed using appropriate adhesive. Stairs without a return (nosing) can be installed as one piece over the tread and riser. Stairs with a return must be cut and installed with the tread and riser being separate pieces.

**13.3.1 Carpet Direction** –It is highly recommended that carpet be installed parallel to length of stairs.

**Note:** Most manufacturers recommend carpet pile direction run up the stairs.

## **14. Carpet Modules**

Carpet manufacturer recommendations about application, squareness and location of working chalk lines must be followed precisely. Modular carpet must be installed on 90° formats, with corners aligned according to manufacturer specifications.

**14.1 Joints** - Modules in the completed installation must be snugly joined. Continually check that modules are being joined with correct firmness. To ensure proper spacing when installing carpet tiles, measure the distance covered by 11 modules (10 joints) installed on the floor with no visible gaps, peaks or overlaps. This distance should be in compliance with manufacturer specifications for the particular product being installed. Care must be taken to not trap yarn between modules.

**14.2 Adhesive Application** - Follow manufacturer's recommendations. Generally, a thin film of pressure-sensitive adhesive is used to prevent lateral movement of modules.

## 15. Patterned Carpet Installations

**15.1 Uninstalled Patterned Carpet** - Carpet is a textile fabric subject to inevitable processing variations in the four pattern conditions: bow, skew/bias, repeat variations and trueness of edges. Measurement of these four conditions is performed on an uninstalled breath of carpet. Although individual manufacturers have tolerances to which their patterned products must conform, there are no industry standards for carpet pattern variations.

**15.2 Understanding Carpet Manufacturer Tolerances** – A successful patterned carpet installation requires a thorough understanding of patterned carpet characteristics by designers, specifiers, and all others involved with carpet selection and installation. Carpet is a textile fabric subject to inevitable process variations, which are more critical when patterns are involved. Most manufacturers provide established tolerances and specific installation instructions for their patterned goods, although most do not guarantee exact pattern match. Skilled, responsible and competent craftsmen, who are experienced in the installation of patterned carpet, can effectively make adjustments within manufacturer tolerances to provide a successful installation. To assist this process, manufacturer tolerances must be clearly understood, communicated and agreed upon by all parties prior to the specification, bid, purchase and installation. There always must be an understanding about the additional carpet that must be allowed for pattern match.

Factors affecting an acceptable pattern match on the job site include, but are not limited to: the method of installation, the condition and levelness of the floor and the type of carpet backing system selected. It is imperative that all parties agree upon realistic levels of expectation before the carpet is installed.

Installation of patterned carpet requires more time and expertise, often requiring the use of power stretchers and additional staffing, thus affecting the cost of installation.

**15.3 Pattern Size Selection** - Selecting larger patterns will facilitate matching ease.

**15.4 Patterned Carpet Installation Methods** - Generally, patterned carpet may be installed by all installation methods. Consult the carpet manufacturer for restrictions.

**15.5 Seaming Diagram** - The seaming diagram must reflect the desired pattern direction and balance within the area (6.1).

**15.5.1 Patterned Carpet in Corridors** - It is highly recommended that carpet with width-wise linear patterns not be installed breath-to-breath along the length of a corridor

**15.6 Roll Sequence** - Sequence carpet cuts working from the longest measured repeat gradually down the shortest repeat within the dye lot. Roll sequencing information is available from the carpet manufacturer.

**15.7 Carpet Layout** – Carpet must be laid out according to the seaming diagram. When possible, carpet must be unrolled and allowed to relax before installation. Pre-cutting of carpet is recommended.

**15.8 Seaming** – Refer to Section 8.

**15.9 Pattern Adjustment** - Pattern adjustment during installation is possible and should be anticipated.

**15.10 Pattern Alignment** - Match the pattern at the midpoint of the seam's length. Work from the seam's midpoint to the seam ends. Bring the pattern into register using appropriate tools that might include:

- power stretcher
- knee kicker
- dead man
- “dry” lines
- stay nails
- mini-stretcher with seam repair attachment (“crab stretcher”)

## **16. Protecting Indoor Installations**

**16.1 Curing Adhesives** – It is highly recommended that traffic over field-applied adhesive installations be restricted for a minimum of 24-48 hours to allow adhesives to cure properly. Premature trafficking can cause installation failure. Restrict carpet exposure to water from cleaning or other sources for a minimum of 30 days.

**16.2 Materials for Protection** - If required to protect the finished floor covering from soil or paint, or if additional work is to be done after the installation, cover it with a non-staining building material paper. Protect the installation from rolling traffic by using sheets of hardboard or plywood in potentially affected areas

**CAUTION:** Do not place plastic sheeting over any carpet installation because it may present a slip hazard and may leave residues that result in rapid soiling after removal. In addition, it may trap moisture, which may promote mold growth, and retard adhesive curing.

**16.3 Maintain Temperature** – Do not allow the temperature of indoor carpeted areas to fall below 50° F (10° C), regardless of the age of the installation.

**17. Outdoor Carpet and Synthetic Turf Installation** - Outdoor carpet installed with adhesives creates conditions quite different from those encountered indoors. Both



carpet and adhesive are subjected to extreme weather and traffic. Further, installation surfaces are much more varied and often are uneven.

**Note:** Installing artificial turf on athletic fields is a highly specialized procedure and is outside the scope of this standard. Consult the manufacturer for specific installation instructions.

- 17.1 Carpet Selection** - Carpet to be installed outdoors must be of the construction, and backing and fiber type recommended for outdoor use.
- 17.2 Site Conditions** - All installation surfaces must be clean, dry, sound, cured, smooth and have adequate drainage. Temperature during installation must be a minimum of 55°F (13°C) and a maximum of 95°F (35°C).
  - 17.2.1 Concrete** - Concrete surfaces must be clean, dry and free from excess alkalinity. Wax must be removed, and painted surfaces must be sanded thoroughly and cleaned before installation.
  - 17.2.2 Wood** - Painted wood surfaces must be roughened prior to installation. Slotted wood surfaces must be covered with an outdoor-grade plywood and primed with a primer that is compatible with the adhesive selected. Waxed or oiled wood surfaces present special problems and require resurfacing. Adhesive installations over pressure-treated lumber generally are not recommended. Contact the adhesive and carpet manufacturer for recommendations.
  - 17.2.3 Metal** - Metal surfaces must be cleaned of grease, oil, soil and rust, and they must be properly primed. Painted metal surfaces must be rough-sanded, with loose paint removed. Aluminum surfaces should be sanded immediately before applying adhesive.
  - 17.2.4 Terrazzo, Ceramic, and Marble** - These surfaces must be clean and dry with all finishes removed.
  - 17.2.5 Slate and Brick** - These surfaces may be too rough and uneven for most outdoor installations and may require refinishing and leveling before installing carpet.
  - 17.2.6 Asphalt** - Asphalt surfaces must be clean, dry, free from excessive oil and grease, and in good condition. New asphalt must be cured for at least 30 days, or longer, depending upon weather conditions. Follow adhesive manufacturer's recommendation.
  - 17.2.7 Swimming Pools** - Regardless of the surface encountered, indoor swimming pools should be drained and dry before installing outdoor carpet. Outdoor pools must not be used during carpet installation. Fungus or algae must be removed from the surfaces to be covered. Indoor pool areas must be ventilated, to reduce excess humidity.

**17.3 Backing Materials** - The backing material present is critical in the installation of outdoor carpet. Outdoor carpet backings are classified as follows:

- fabric - polypropylene, either woven or nonwoven
- vinyl - unitary or foam (require special adhesives)
- polyurethane - unitary or foam, either smooth or patterned
- latex rubber - smooth, foam waffle, or diamond shape

**CAUTION:** Using the correct adhesive greatly enhances the success of an outdoor installation. When the backing material is unknown, or if doubt exists, contact the carpet manufacturer for positive identification.

**17.4 Adhesives** - Adhesive selection is very important. Carpet backings and substrates must be compatible with the adhesive. Recommended adhesives for outdoor installations are:

- Solvent-based – These adhesives also are referred to as “all-weather” carpet adhesives. These adhesives are preferred for outdoor installations. They can be applied in a wide range of weather conditions and are water resistant. Some contain flammable solvents and should only be used outdoors. Consult the adhesive manufacturer for recommendations.
- Latex (Water)-based – These adhesives must be formulated for outdoor use. Avoid applying them in damp, humid, or extreme cold or hot conditions.

**CAUTION:** Regardless of type, some adhesives may not be compatible with all carpet backings.

**17.5 Layout** - All outdoor carpet must be unrolled and allowed to relax at least one hour before installation. This must take place when the temperature is between 55°F and 95°F (13°C and 35°C). Carpet must be pre-cut for the area to be covered, allowing for required trimming. Seams must be kept to a minimum and run with the traffic pattern when possible. Knee-kickers may be used to position the carpet properly, but they must be used with caution. Where seams are required, be certain that the pile lay runs in the same direction on both sides of the seam.

**17.6 Edge seaming** - A bead of seam adhesive must be applied to all seam edges of tufted outdoor carpet, as well as all exposed edges (See Section 8.5). Needle-punch carpet normally does not need exposed edges sealed; however, refer to manufacturer's recommendations.

**17.7 Rolling** - Generally, outdoor carpet requires rolling after installation. The size and weight of the roller should be specified by either the carpet or adhesive manufacturer.

**17.8 Finishing** – Brush all seams and trim protruding pile tufts. Excess adhesive must be removed carefully with a suitable safety solvent recommended by the adhesive manufacturer.

**Note:** For indoor installation of outdoor carpet, follow the procedures outlined in Section 8, except where outdoor conditions may also exist, such as indoor swimming pools, health spas, and indoor-outdoor patios. Do not use flammable adhesives for any indoor installation.

## Appendices

**Table I**

**Adhesives – Common Types Used in Carpet Installation**

**A. Carpet Floor Adhesives**

1. **Latex Adhesive:** For installing carpet, excluding those with vinyl backing. Refer to carpet manufacturer for adhesive grade recommendation for specific backings and uses.
2. **Vinyl-Back Carpet Adhesive:** Adhesive specifically formulated for permanent installation of vinyl back carpet.
3. **Modular-Carpet Adhesive:** Pressure sensitive type adhesive for releasable installation of modular carpets. Note: Always consult manufacturer for proper type adhesive.
4. **All-Weather Carpet Adhesive:** Water resistant adhesive for installations of carpet designed for outdoor use. Refer to adhesive manufacturer for adhesive grade recommendation for specific backings.
5. **Polyurethane Carpet Adhesive:** For installing specific polyurethane backings. Refer to adhesive manufacturer.
6. **Contact Adhesive:** Used for bonding various carpet edge moldings to a substrate. It can be used for adhering carpet to difficult or irregular surfaces.

**B. Carpet Seaming Adhesives (Seam Sealer)**

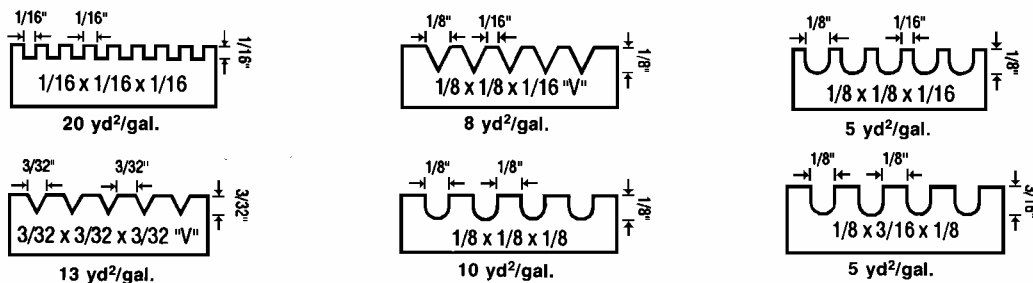
1. **Glue-Down Seam Adhesive:** Produced in either solvent base (contact type) or solvent free formulations. May be synthetic latex based.
2. **Vinyl-back Seam Adhesive:** Solvent-based (chemical weld) or solvent-free (mechanical bond).
3. **Latex Seam Adhesive:** For applying seaming tapes, reinforcing sewn seams, sealing trimmed edges prior to “hot melt” seaming, securing binding, etc.
4. **Hot melt seam adhesive:** A thermoplastic adhesive used for adhesive or stretch-in applications.

**Table II**

<b>Trowel Size – Minimum Guidelines</b>				
<b>Direct Glue Down</b>				
	<b>Trowel Size (in inches*)</b>			
<b>Type Carpet Back</b>	<b>Notch Width</b>	<b>Notch Depth</b>	<b>Space Between</b>	<b>Notch Shape</b>
Polypropylene, woven mesh	1/8	1/8	1/16	V
Secondary	1/8	1/8	1/8	U
Unitary, no secondary fabric	1/8	1/8	1/16	V
	1/8	1/8	1/8	U
Woven carpet	1/8	1/8	1/16	V
	1/8	1/8	1/8	U
Non-woven	Refer to manufacturer recommendations			
Hot-melt polymer	1/8	1/8	1/16	V
Woven jute secondary	3/32	3/32	3/32	V
Attached cushion	3/32	3/32	3/32	V
Vinyl-backed broadloom	3/32	3/32	3/32	V
Modular carpet tiles	Refer to manufacturer recommendations			
<b>Double Glue-Down</b>				
Cushion to floor	1/16	1/16	1/16	□
Carpet to cushion:				
-smooth back carpet	1/8	1/8	1/16	U
-rough back carpet	1/8	3/16	1/8	U

**Notes:** The above guidelines should only be used when specific recommendations are not available from the carpet manufacturer and/or the adhesive supplier. Rough, porous concrete surfaces and heavily textured carpet backs often require trowels with deeper notches than listed above.

**Actual size trowel notch and reasonable expected spread rate.**



## Guidelines for Maintaining Indoor Air Quality During Carpet Installation

- Consumers always should ventilate with fresh air during all phases of installation. This includes exhausting to the outside and avoiding re-circulation. Most emissions from the installation dissipate quickly with adequate air exchange and ventilation.
- Vacuum old carpet thoroughly before removal to minimize the amount of dust particles.

Note: When selecting a new vacuum cleaner, look for units bearing the CRI Indoor Air Quality Program "Green Label." This label identifies vacuums that have been tested and meet minimum standards for dust containment, soil removal, and carpet appearance retention.

- Vacuum the floor immediately after old carpet and cushion have been removed.
- Continue operating the ventilation system at normal room temperature for up to 72 hours after installation. If possible, open doors and windows to increase fresh airflow.
- If carpet is to be glued to the floor, use a low-emitting floor covering adhesive. Low-emitting floor covering adhesives may be identified by the CRI Adhesive Program label on the container, or by contacting CRI as indicated below.
- If occupants consider themselves unusually sensitive to chemicals, 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 24 hours or more before installation.



Look for and purchase carpet, carpet cushion and floor covering installation adhesive products that display the Carpet and Rug Institute (CRI) Indoor Air Quality label. These three indoor air quality testing programs identify the products that have been tested and meet stringent indoor air quality requirements for low emissions. For further information on these programs, plus the CRI vacuum cleaner testing program, contact CRI at 800-882-8846 or visit our website at [www.carpet-rug.com](http://www.carpet-rug.com).

## DEFINITIONS OF TERMS

**adhesive** – A substance that dries to a film capable of holding materials together by surface attachment. [Applying adhesive to the floor normally is accomplished with a trowel, airless spray, or roller.]

**adhesive transfer** – When installing carpet, the degree of coverage and/or penetration of the applied adhesive into the back of carpet, while maintaining full coverage of the floor. [The degree of coverage may be influenced by adhesive type, method of installation, open assembly time and other factors.]

**alkali** – A soluble substance with basic properties and having a pH greater than 7.

**attached cushion** – Cushion material permanently bonded to the back of carpet and rugs by the manufacturer.

**Axminster carpet** – Carpet woven on an Axminster loom. Pile tufts are inserted individually from a variety of colored yarns arranged on wide spools, making possible the production of carpet and rugs in complex designs with many colors, such as Oriental design.

**baseboard** – A board skirting the lower edge of a wall, covering the joint of the wall and the adjoining floor.

**birdcage** – Common term used to describe the end of a stair rail where the banisters are curved in a spiral to form a newel post.

**bow** – see pattern bow

**bullnose** – Common term used for an elongated (wider) step rounded at one or both side ends .

**carpet cushion** – Material placed under carpet to provide resiliency, support, and noise absorption. Also referred to as carpet lining, padding, or underlay, although “carpet cushion” is the preferred industry term.

**conditioning** – The process of allowing the carpet to relax or acclimate to the environment into which it is to be installed.

**crab stretcher** – Hand device used for stretching carpet in a confined area and aligning patterns where a power stretcher cannot be used and is not practical. Also used for removing fullness at seams and closing gaps at seams.

**custom carpet** – A carpet or rug manufactured in a special size, shape, color, design, or width by a tufted or woven manufacturing process.

**dead man** – A device used in carpet installation to provide a point of resistance for facilitating stretching procedures. Construction is a board with strips of tackstrip attached to the bottom side.

**direct glue down** – An installation method whereby the carpet is adhered to the floor.

**double glue down** – An installation method whereby the carpet cushion is first adhered to the floor, and the carpet is then adhered to the cushion.

**dry line** – A length of line or cord, which is stretched over carpet and used to aid in pattern alignment: lasers also may be used in this capacity.



**gully** – The distance between the tackstrip and the wall. A gully should always be slightly less than the thickness of the carpet and not exceeding 3/8 inch.

**knee-kicker** – An installation tool designed to position carpet and move it onto the tackstrip. [NOTE: With the exception of stair installation, knee-kickers should only be used for positioning and hooking the carpet onto the tackstrip and not for stretching carpet. A power stretcher should always be used for stretching carpet during installation. See definition of power stretcher.]

**knitted carpet** – Carpet produced in a fabric formation of interlacing yarns in a series of connected loops by the use of needles. Pile and backing are produced simultaneously. Multiple sets of needles interlace pile, backing, and stitching yarns in one operation.

**modular carpet** – Carpet squares, often 18 inches by 18 inches (457 x 457 mm) each but also available in other sizes, with or without attached cushion backing. Also referred to as “carpet tiles.”

**molding** – A wooden, metal, vinyl, or plastic strip, either quarter round or shoe molding, attached to the bottom of a baseboard or wall to cover the joint between wall and floor or to cover raw edges of carpet at doorways or where carpet abuts another type of floor covering. There are two basic types: 1) Applied before – Shapes put in place before carpet is installed and carpet is fitted to them, commonly called “gripper bar”; 2) Applied after – Shapes put in place on top of installed carpet commonly called “binder bar.”

**open time** – The time interval between the spreading of adhesive on a substrate and the appropriate placement of a floor covering material into the adhesive for bonding.

**patching** – Floor preparation process of filling holes, cracks, breaches, etc., in a floor substrate prior to installation of carpet

**pattern bow** – A distortion visible as wavy or crooked pattern lines when viewed across carpet width.

**pattern elongation** – A variation of cumulative pattern measurements from one breadth to the next. Often referred to as “pattern run-off” or “repeat variation.” [Sequencing of cuts minimizes effects.]

**pattern skew** – A distortion visible when the pattern on one side is slightly ahead of the pattern on the other side. Skew, or bias, describes pattern squareness.

**pH** – A value representing the concentration of hydrogen ions in gram equivalents per liter used to indicate the acidity or alkalinity of a substance on a scale from 0 to 14 with 7 representing neutrality, numbers less than 7 increasing acidity, and numbers greater than 7 increasing alkalinity. [Laboratory and field testing for pH must be done with distilled water.]

**power stretcher** – A carpet installation tool used to stretch carpet for installation on the tackstrip. Consists of a pinned plate that grips the carpet, tubular extensions, a padded end used to brace against an opposing wall or other structure, and a lever system that multiplies the installer’s applied stretching force.

**quarter-round** – Wooden or plastic molding with a cross section that is a 90° arc of a circle. Used as joints between walls and floors or between larger moldings and floors.

**relax** – See “conditioning.”

**restretch** – Stretching installed carpet after original installation to remove wrinkles and bubbles or to correct loose fit.

**riser** – The upright part of a step between two stair treads.

**seam** – In a carpet installation, the joints or interface of two pieces of carpet by the use of various securing techniques.

**seam adhesive** – A specifically formulated adhesive for securing cut edges of carpet to be seamed.

**seam peaking** – The slight elevation of taped seams, which usually renders the seam more visible, resulting from stretching of the carpet. [Sometimes referred to as “seam stress realignment” peaking is a natural and sometimes unavoidable condition and not the result of a manufacturing or installation defect. For additional information, refer to CRI Technical Bulletin “Peaking Seams in Stretch-In Carpet Installations.”]

**seam sealing** – Common term used to describe the application of seam adhesive to secure cut edges of carpet to be seamed.

**seaming tape** – Fabric tape used for joining two sections of carpet. [“Hot melt” tape is pre-coated with a thermoplastic adhesive. Adhesives may be applied separately to other types of seaming tapes.]

**secondary backing** – Woven or non-woven fabric reinforcement laminated to the back of tufted carpet, usually with an adhesive, to enhance dimensional stability, strength, stretch resistance, and ease of handling.

**selvage (selvedge)** – The lengthwise, factory-finished edge portion of a carpet.

**shoe molding** – Wood or plastic strip with one corner edge rounded slightly. Used to conceal joints between walls and floors or between larger moldings and floors

**stair nosing** – Material used to cover the nose of a stair when stairway is not upholstered. Commonly used to demarcate the edge of a stair in restaurants, theaters, etc.

**stay nailing** – A temporary fastening of carpet to the floor to prevent movement until permanent fastening with tackstrips, adhesives, or other means is possible.

**stretch-in** – Installation method whereby carpet is placed over separate carpet cushion and is secured in place, under tension, using a power stretcher.

**tackstrip** – Wood or metal strip fastened to the floor near the walls of a room, containing either two or three rows of pins angled toward the walls on which the carpet is stretched and secured in a stretch-in installation. (Also referred to as “tackless strip”)

**telegraphing** – The gradual appearance of irregularities, imperfections, or patterns from a substrate onto the surface of the carpet or other floor covering.

**textile floor covering** – General description used for carpet, rugs, etc.

**threshold** – The raised material beneath a door. Also known as a “door sill” or “saddle.”

**tread** – The upper horizontal part of a stair.

**trowel** – Hand implement used for metering and spreading adhesive to the floor or other substrate.

**trueness of edge** – lengthwise pattern bow. It is generally measured as maximum deviation from a straight line, over a fairly long distance, between common pattern points along the edge of the carpet at or very close to where the edge will be trimmed for seaming.

**tufted carpet** – Carpet manufactured by the tufting process. Pile yarns are inserted into a primary backing fabric by rows of eyed needles.

**unitary carpet** – Carpet backcoated with high performance, often impermeable compound that yields increased tuft bind properties with or without the addition of secondary backing.

**VOC** – Abbreviation for Volatile Organic Compound.

**velvet carpet** – 1) Carpet woven on a velvet loom; typically cut pile or level loop in solid or tweed colorings, though textured and patterned effects are possible; 2) Common term for cut pile “plush” carpet.

**vinyl plasticizer** – A substance incorporated into polyvinyl chloride polymer to increase flexibility, workability, or distensibility (capable of being extended).

**wall base** – Various finished trim materials, carpet, resilient, wood, or other, attached at the base of a vertical surface.

**Wilton carpet** – Carpet woven on a loom equipped with a Jacquard mechanism, which utilizes a series of punched cards to select pile height and yarn color. May be cut pile or loop pile or combination.

**woven carpet** – Carpet produced on a loom. The lengthwise (warp) yarns and widthwise (weft or filling) yarns are interlaced to form the fabric. Carpet weaves, such as Wilton, Axminster and velvet, are complex, often involving several sets of warp and filling yarns for the pile and backing.