

CRI CARPET INSTALLATION STANDARD

EFFECTIVE OCTOBER 1, 2009

First Edition

**The Carpet and Rug Institute
730 College Drive
P.O. Box 2048
Dalton, Georgia 30722-2048
706/ 278-3176**

COPYRIGHT PENDING

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.

CONTENTS

Foreword	. . . . .	1
Acknowledgements	. . . . .	2
 Section Number		
1. Scope.	. . . . .	3
2. Applicable Documents and References.	. . . . .	3
3. Terminology .	. . . . .	3
4. Tools and Materials	. . . . .	3
5. Storage and Handling	. . . . .	3
6. Planning	. . . . .	4
7. Site Conditions – All Installations	. . . . .	6
8. Substrates	. . . . .	8
9. Testing Concrete Substrates	. . . . .	8
10. Relaxing/Conditioning Carpet	. . . . .	9
11. Ventilation	. . . . .	9
12. Carpet Seam Edge Preparation	. . . . .	10
13. Direct Glue-Down Installation	. . . . .	10
14. Double Glue-Down Installation	. . . . .	13
15. Attached Cushion Installation	. . . . .	14
16. Stretch-In Installation	. . . . .	15
Illustration	. . . . .	17
17. Carpet on Stairs	. . . . .	19
18. Modular Carpet	. . . . .	19
19. Patterned Carpet Installation	. . . . .	20
20. Protecting Indoor Installations	. . . . .	21
21. Outdoor Carpet and Synthetic Turf Installation	. . . . .	22
 Appendices		
Adhesives – Common Types (Table I)	. . . . .	25
Trowel Size – Minimum Guidelines (Table II)	. . . . .	26
Guidelines for Maintaining Indoor Air Quality during Carpet Installation	. . . . .	27
Pattern Repeat Illustration	. . . . .	28
Pattern Bow Illustration	. . . . .	29
Pattern Bias Illustration	. . . . .	30
Definitions of Terms	. . . . .	31

FOREWORD

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

Failure to follow this minimum standard requirement for installation cannot 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 unusual circumstances, contact the product manufacturer for specific guidance. Carelessness is never acceptable and common sense should prevail in all cases. The Standard requires 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 minimum standard requirement was prepared under the direction of the Installation Issues Management Team of the Carpet and Rug Institute and in cooperation with experts in the carpet installation and related fields.

CRI Carpet Installation Standard 2009

1. **Scope**

This document establishes minimum industry standards for commercial carpet installation.

2. **Applicable Documents and References**

2.1 Carpet and Rug Institute References:

- *The Carpet Primer* *
- *Characteristics of Patterned Carpet Technical Bulletin* *

* Downloadable from The Carpet and Rug Institute web site www.carpet-rug.org

2.2 ASTM Standards:

- ASTM F-1869-04 – *Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Calcium Chloride*,
- ASTM F-710-08 – *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
- ASTM F-2170 – In-situ Relative Humidity Testing

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**

Install carpet 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 – Store carpet and related materials in a climate-controlled, dry space. Protect carpet from soil, dust, moisture and other contaminants and store on a flat surface. Stacking heavy objects on top of carpet rolls or stacking more than three rolls is prohibited.

5.2 Handling – Transport carpet in a manner that prevents damage and distortion. Bending or folding individual carpet rolls or cuts from rolls is not recommended. When bending or folding is unavoidable for delivery purposes, the carpet is

required to 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 type of carpet, carpet quantities, quantity per dye lot, installation method, cushions, adhesives, transition moldings, wall base types and other accessories, and to identify the proper location of seams.

On new construction, provide architectural drawings 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, provide new measurements and shop drawings.

Consideration should be given to carpet and adhesive conditioning, material delivery considerations and other trades' schedules. (Refer to Section 10)

6.1 Shop Drawings - The carpet shop drawing is required to contain the following information:

- Name of the job, owner and installation company. On new construction the name of the general contractor and architectural firm are required.
- 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 substrate for each area
- Required floor preparation, materials and quantities.
- Type of installation for each area
- Quantities of carpet needed for each area, including roll length requirements, pattern repeat, manufacturer installation sequencing and cut list.
- Exact notations where dye lot changes occur
- Excess material in each area and how it is to be used
- Seam layout of each area

- Allow tolerance by cutting carpet 3-4 inches (75-100 mm) longer than the area measurement
- 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 transitions.
- Type of wall base in each area.

6.2 Planning for Seams - Keep seams to a minimum. Position seams 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 Transitions to Other Surfaces - Where carpet transitions to other floor coverings, the carpet edges are required to be protected or covered with appropriate transition moldings. The edge of the hard surface flooring should not exceed a maximum of 1/16" higher than the total carpet thickness where no transition molding exists. Where no transition molding is used, apply a minimum of 1/8" bead of seam sealer to the edge of the carpet along the entire transition.

Wall base - when vinyl or rubber wall base is used in a direct glue or double glue carpet installation, cove base or base-with-toe is highly recommended.

6.4 Carpet Over Expansion Joints – Do not install carpet over expansion joints (see definition). Expansion joints allow separate substrate 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 are required to be addressed in strict accordance with the appropriate architectural drawing. If no expansion joint device is specified on the drawing, the building owner, owner's representative, or other responsible party is required to be made aware that failure to address expansion joints will potentially result in installation failure, damage to the carpet and/or safety concerns.

6.5 Pile Direction - Where two or more pieces of the same broadloom carpet are adjacent, the pile direction is required to 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.

6.6 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 Substrate 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 will result in problems with: overall appearance, visible damage, soiling, adhesive failure, delamination and dimensional stability. These conditions may not be immediately evident. Refer to Section 16-Protecting Indoor Installations.

- 7.2 Ambient Temperature and Humidity** – The installation is not to begin until the HVAC system is operational and the following conditions are maintained for at least 48 hours before, during and 72 hours after completion. The carpet is to be installed when the indoor temperature is between 65-95°F (18-35°C) with a maximum relative humidity of 65%. The substrate surface temperature should not be less than 65°F (18°C) at time of installation. Do not allow the temperature of indoor carpeted areas to fall below 50° F (10° C), regardless of the age of the installation. If these conditions are not attainable, contact flooring manufacturer for applications to warranty.

- 7.3 Floor Preparation** - Carpet is required to be installed over properly prepared substrates that are suitable for the specific product and installation method selected. All cracks, holes and flooring irregularities are required to be repaired to ensure a smooth, finished appearance, prevent accelerated wear and telegraphing substrate irregularities. Substrates are required to be structurally sound and free of foreign substances that will compromise the carpet or its installation. Patching compounds are required to be suitable for the use application. Select polymer-fortified patching compounds according to the carpet manufacturer's instructions. (Refer to ASTM E1155-96 (2008).

Note: Patched areas may be porous and highly alkaline, which will prevent adequate adhesive bond. For best results, prime patched areas. Consult patch manufacturer for primer recommendations and compatibility with adhesives.

- 7.4 Concrete** - Concrete must be cured, clean and dry. Cracks, chips and saw cuts must be properly patched or treated. Concrete is available in two basic forms; lightweight and normal weight. This difference is based on the type of aggregate used in the mix. Lightweight concrete is most commonly, but not exclusively, used on upper floors. Various screeds and topcoats that are available – typically gypsum based - are NOT lightweight concrete.

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 substrates are required to be structurally sound, flat, dry and securely anchored. Substrates, such as plywood, hardwood, particleboard, oriented strand board, or other materials, are required to be flooring grade (APA approved) and installed according to manufacturer specifications. Irregularities, imperfections and joints are required to be properly patched and prepared. It is required that all protrusions be properly prepared.

7.6 Metal - It is required that metal floors create a smooth, even plane, and be free of grease, oil, soil and rust. It is required that metal or raised access flooring be structurally sound, flat and properly secured.

Note: Adhesives applied to bare metal surfaces can cause rapid oxidation or other chemical reactions. Sand and clean bare aluminum 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 and properly prepared. Additional concerns are carpet backing and adhesive compatibility.

Note: Installing a second layer of finish flooring material, including some carpet types, can trap moisture and result in widespread failure, even over substrates 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. It is required that removal procedures comply with federal, state and local government agency regulations covering the removal and disposal of asbestos-containing materials (ACM).

7.8 Carpet over Carpet - Refer to carpet manufacturer for guidance before installation.

7.9 Radiant-heated Floors – Radiant-heated floors require special consideration in the selection of carpet, carpet cushion, installation methods and adhesive. (Radiant heated floors should not exceed 85°F.)

7.9.1 Unless absolutely certain about the location and depth of heating components, attach tack strip and transitions using adhesive.

7.9.2 The maximum surface temperature of radiant-heated substrates cannot exceed 85°F/29°C.

8.0 Substrates

8.1 Surfaces such as terrazzo, ceramic and natural stone - Remove finishes and prepare flooring surfaces to ensure adhesion. These surfaces are required to be structurally sound and well bonded to substrate. Fill grout lines flush with approved

cementitious leveling or patching compound. Follow the open time recommendations of the adhesive manufacturer when adhering carpet to nonporous substrates.

- 8.2 Slate and Brick** - These surfaces may be too rough and uneven for most installations and may require refinishing and/or smoothing before installing carpet.
- 8.3 Asphalt** – It is required that asphalt surfaces be clean, dry, free from excessive oil and grease, and in good condition. Cure new asphalt for at least 30 days, or longer, depending upon weather conditions. Follow adhesive manufacturer’s recommendation.

9.0 Testing Concrete Substrates

Refer to the carpet manufacturer’s written instructions for guidelines on acceptable testing methods, the number of test sites/data points and the allowable moisture and pH limits. The carpet manufacturer or adhesive manufacturer may have guidelines that suggest that the following three tests should be performed and the test results/data of each test should be within acceptable limits.

- 9.1** Before direct glue-down, double-glue down and some stretch-in (non-porous cushion or carpet) installations, the owner or general contractor, or their designated testing agent, is required to submit to the flooring contractor a written report on the moisture and alkalinity conditions of the concrete substrates.

Note: It is recommended that qualified independent third-party testing agencies be used for determining moisture and alkalinity conditions of a concrete slab. Testing by an independent third party specialist to determine installation suitability is a prudent and necessary safeguard for general contractors, owners, architects, flooring product providers and installation contractors to reduce the risk of concrete slab moisture related flooring problems. As a minimum, testing agencies or individuals are required to demonstrate verifiable experience in concrete moisture testing or be certified by a recognized organization.

Due to the number of available carpet backing types and other variances to be addressed in a successful installation, the testing agencies or individuals are to contact the carpet and adhesive manufacturer for specific guidelines relative to the appropriate moisture and pH testing protocol(s) to be conducted before the carpet installation. Testing to conform to the appropriate ASTM standard(s).

- 9.2 Moisture Vapor Emission Rate (MVER) Testing** - MVER tests must be conducted in accordance with the latest edition of ASTM F 1869, “Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.”
- 9.3 Relative Humidity (RH) Testing** - Testing for internal relative humidity of concrete slabs must be conducted in accordance with the latest edition of ASTM F-2170, “Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.”

- 9.4 Testing for Alkalinity** - Testing the pH at the surface of a concrete slab must be conducted in accordance with the latest edition of ASTM F 710 “Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring”.

Note: Preparing the surface of a concrete slab for pH testing can be problematical. Make sure the concrete surface is adequately cleaned of adhesives, curing compounds etc. When pH readings are less than 8.5, it may be an indication of a residue remaining on the concrete surface. Also use care not to over clean the surface of the concrete, consequently removing the (usually) thin layer of carbonation. This can result in pH readings >12.

Caution: 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 are required to be maintained 48 hrs prior to, and during testing. The installation of a permanent, effective moisture vapor retarder with a minimum thickness of 0.010 inch and a permanency of 0.1 perms, as described in ASTM Specification E 1745, is required under all on-grade or below-grade concrete floors.

- 10. 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 time period that conforms to the requirements of the manufacturer of the product being installed. (See Section 7.2 Ambient Conditions) This time period will vary up to 72 hours, but should not be less than 24 hours at a temperature between 65-95°F (18 -35°C). Protect carpet adequately from soil, dust, moisture and other contaminants. Sundry items, such as adhesives, should be conditioned as well. If these conditions are not attainable, contact flooring manufacturer for applications to warranty.

Note: The allocation of time for the relaxation period should be included in the planning of the job by all interested parties.

- 11. Ventilation** - During installation, maintain air circulation by operating the HVAC system at full capacity.

Note: For acceptable indoor air quality, fresh air ventilation in commercial spaces is recommended to conform to current guidelines specified in ASHRAE Standard 62 published by the American Society of Heating, Refrigerating and Air Conditioning Engineers (www.ashrae.org). Failure to comply could cause negative ramifications to the installation and the indoor air quality.

12. Carpet Seam Edge Preparation

Properly prepare all edges that are used for seams in strict compliance with carpet manufacturer recommendations.

- 12.1 Trimming** – Trim carpet edges at seams using tools and techniques best suited for the carpet style (e.g., loop-pile, cut-pile, cut-and-loop pile, woven carpet) in accordance with manufacturer recommendations. Trim edges far enough into the material to maintain the structural integrity of the carpet and to maintain pattern design where applicable.

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 are not to be trimmed. Contact carpet manufacturers for specific recommendations.

- 12.2 Sealing Edges** – Regardless of installation method, most carpet requires an edge protective material be introduced between the edges to be joined. This material can be a liquid or thermoplastic and can be applied using various procedures and techniques. Consult the manufacturer of the products for specific sealing procedures.

CAUTION: Failure to properly prepare seam edges often results in:

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

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

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

13. Direct Glue-Down Installation

- 13.1 Relaxation/Conditioning Carpet** – Refer to Section 10.

- 13.2 Additional Substrate Requirements** – It is required that substrates be clean, structurally sound, dry, and with no cracks, existing adhesives and surface irregularities that might show through the finished installation or cause premature wear and be free from contaminants that may interfere with adhesion. Substrate temperatures below 65 °F are unsuitable for adhesive application.

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

Note: It is the general contractor or building owner’s responsibility to supply a substrate that meets agreed upon specifications as defined by ASTM E1155-96 (2008).

- 13.2.1 Treated Wood** – Wood that is chemically treated to alter properties relating to outdoor exposure or flame resistance is not a suitable substrate for direct glue-down applications. Floor covering adhesives would be subject to chemical degradation when applied to these surfaces.

13.2.2 Painted Surfaces - Painted surfaces may be suitable for adhesive application; however, contact the carpet and adhesive manufacturer for recommendations.

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 local, state, and Federal lead abatement regulations.

13.2.3 Resilient Floor Coverings – It is not recommended that carpet adhesive systems be used directly over existing sheet vinyl, laminated or solid vinyl tile, and some rubber flooring products. These materials may contain plasticizers that could migrate into the carpet adhesive and loosen the bond. Contact individual manufacturers for specific recommendations. Direct glue-down installations over 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.

Caution: any resilient tile may have the possibility of containing asbestos. This can be verified by an independent testing laboratory. Vinyl asbestos tile requires specific precautions. Refer to local, state or Federal regulations.

13.2.4 Surfaces such as terrazzo, ceramic and natural stone - Remove finishes and prepare flooring surfaces to ensure adhesion. These surfaces are required to be structurally sound and well bonded to substrate. Fill grout lines flush with approved cementitious leveling or patching compound. Follow the open time recommendations of the adhesive manufacturer when adhering carpet to nonporous substrates.

13.2.5 Primers – Primers are used to enhance substrate adhesion characteristics and address porosity. Substrates that are overly porous, chalky or have varying degrees of porosity require priming. Priming under or over patched areas and between layers of patching compound may be required by the patching compound or the adhesive manufacturer. Priming may be recommended for carpet with factory applied adhesive systems. Ensure that priming products are compatible with substrate conditions, patch and adhesives.

13.2.6 Liquid Adhesive Removers - These products are not recommended for use on a substrate that will receive a floor covering to be installed with adhesive.

13.2.7 Sweeping Compounds - These compounds may leave residue that interferes with adhesive bonding. Do not use sweeping compounds prior to adhesive application. Vacuum dusty areas instead. Vacuum is required to have a properly functioning filter per OSHA and/or EPA requirements.

13.2.8 Layout – Lay out the carpet according to the seaming diagram. Where applicable, allow for pattern repeat. Align all carpet breadths to their proper position and trim seams.

13.3 Floor Adhesive Application

13.3.1 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.

13.3.2 Adhesive Application - Spread floor adhesive uniformly over the substrate with an appropriate trowel, leaving ridges of sufficient height to achieve full and complete coverage of both the substrate and carpet backing. Trowel notches wear down during use. Maintain a clean and properly notched trowel throughout the installation process. After sufficient open time, press carpet into the adhesive and roll with an appropriate roller as specified in section 14.7.

CAUTION: Bond failure most often is caused by:

- inadequate adhesive application from incorrect trowel notch size and/or trowel notch configuration or improper trowel angle during application
- improper type and grade of adhesive
- incorrect open time and/or working times
- bond breakers or substrate contaminants such as, but not limited to, residual curing and parting compounds
- pH and moisture-related problems
- lack of protection (see Section 20)
- premature traffic or cleaning before adhesives have adequately cured

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

13.3.4 Working Time - (also referred to as slip time) – length of time after covering the adhesive with carpet to make adjustments or manipulate the carpet without negatively impacting the permanent bond.

13.4 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.

13.5 Seam Adhesive (“Sealer”) - For carpet systems that require seam sealing, apply an appropriate seam adhesive in sufficient quantity to seal both edges trimmed for seaming, covering the thickness of the primary and secondary backing without contaminating face yarns (See Figure 1). This insures that all edges trimmed for seaming are protected from edge ravel. Allow seam adhesive to dry before proceeding with the installation to prevent transfer to the face yarn. An additional bead of seam adhesive is applied to the cut edge of one side only, after that side is first placed into the floor adhesive. In order to weld the seam edges together, while the seam adhesive is still transferrable, abut the edges to form the seam.

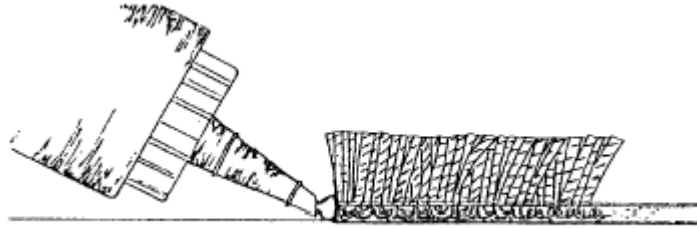


Figure 1

- 13.6 Rolling** – After the recommended amount of adhesive has been applied to the floor and the prescribed open time has been allowed, the carpet is carefully placed into the adhesive. To insure an adequate bond, it is then required that the carpet be uniformly pressed into the adhesive using a roller designed for this purpose. Rolling should be performed with the lightest roller that will cause the adhesive applied to the floor to fully coat the back of the carpet (with a minimum mirror image of the adhesive applied to the floor) while still covering 100% of the floor. Do not exceed 75 lbs. unless specifically directed by the manufacturer. Roll the carpet in both length and width directions.

NOTE: In some circumstances, re-rolling is required as well as the placement of weights in problematic areas. A hand roller should be used around walls and other obstructions to insure a proper bond is formed in these areas.

- 13.7 Finishing at Wall Line** – Finish the installation along the wall line leaving a neat, smooth, neat, and secure fit.

14. Double-Glue-Down Installation

- 14.1 Relaxation/Conditioning Carpet** – Refer to Section 10.0. In double-glue down installations, a separate cushion is adhered to the substrate and the carpet is glued to the cushion.

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

- 14.2 Preparation** – Refer to Section 6.0 and 9.0 of this Standard for floor preparation requirements.

- 14.3 Cushion installation** - Install cushion in the longest continuous lengths possible with consideration to traffic patterns and carpet seam placement. It is required that cushion seams be at a right angle (90°) to carpet seams or offset at least six inches (150 mm). Butt cushion seams net without compression, leaving no gaps. Do not tape or staple cushion seams for double glue down installations.

14.4 Layout –Where applicable, allow for pattern repeat. Align all carpet breadths to their proper position and trim seams. Take care to avoid cutting into cushion under seams.

14.5 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. Spread adhesive 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.

Note: excessive trowel pressure causes cushion to expand into the trowel notch reducing effective adhesive coverage rate.

14.6 Seaming - A variety of seaming options exist. Consult the cushion and carpet manufacturer for specific recommendations.

14.7 Rolling – Refer to Section 13.6.

15. Attached-Cushion Installations

15.1 Relaxing/Conditioning Carpet – Refer to Section 7.11.

15.2 Carpet Layout - Refer to Section 9.2 (Direct-Glue Installations)

15.3 Floor-Applied Adhesive Installations - Use the carpet adhesive and seam adhesive recommended by the carpet or adhesive manufacturer. Also, refer to Table II.

15.3.1 Trowel Notch Size - Refer to Table II

15.3.2 Open Time – Allow adequate open time for adhesive. Open time varies depending upon environmental conditions and the adhesive type.

15.3.3 Installation Procedures – Cut seam edges with appropriate tools based on carpet manufacturer recommendations. Trim edges to eliminate possible height variation at the seam. In the case of woven goods, carefully refer to the manufacturer’s recommendation for that specific style. Seal cut edges at seams with proper seam adhesive applied as recommended by the carpet or adhesive manufacturer. Roll installed carpet according to manufacturer recommendations.

15.4 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 and the use of primers, if needed.

15.5 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.

16. Stretch-in Installation

This method involves installing carpet under tension over a separate cushion, using tack strip fastened at all walls and other vertical abutments around the perimeter of the area.

16.1 Relaxing/Conditioning Carpet – Refer to Section 7.11.

16.2 Tack strip –It is required that tack strip be a minimum of one inch (25 mm) wide and ¼ inch (6 mm) thick. Architectural strip two inches in width (50mm) with three rows of pins, or two conventional strips with two rows of pins each are required for stretching areas exceeding thirty feet to provide secure attachment of the carpet and additional shear strength. To prevent possible injury to building occupants, it is required that the pins on tack strip not protrude through the carpet being installed.

Additional tack strip installation specifications include:

- Securely fasten tack strip to maintain the tension _ provided by power stretching. Nailed or stapled tack strip is required to have a minimum of two fasteners per piece.
- Place tack strip with the pins angled toward the vertical abutment.
- The gully, or distance between the tack strip and vertical abutments, is required to be slightly less than the thickness of the carpet but not exceed ⅜ inch (9 mm).
- Avoid installing tack strip across door openings and/or sills.
- Cut tack strip to follow the contour of door casings and other irregularly shaped abutments.
- Do not staple carpet to tack strip.
- On radiant-heated floors, use manufacturer's approved adhesive to secure tack strip do not use nails or screws to prevent damage to heating system.

16.3 Separate Cushion Selection –It is required that the cushion 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 ⅜ inch (10 mm).**

Install separate carpet cushion 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. Trim cushion flush with the inside contour of the tack strip and securely fastened to the substrate using staples or nonflammable cushion adhesive at all seams and around the perimeter of each room. With the exception

of fiber cushions, secure seams with appropriate vinyl-coated cloth cushion tape per the carpet cushion manufacturer's recommendations.

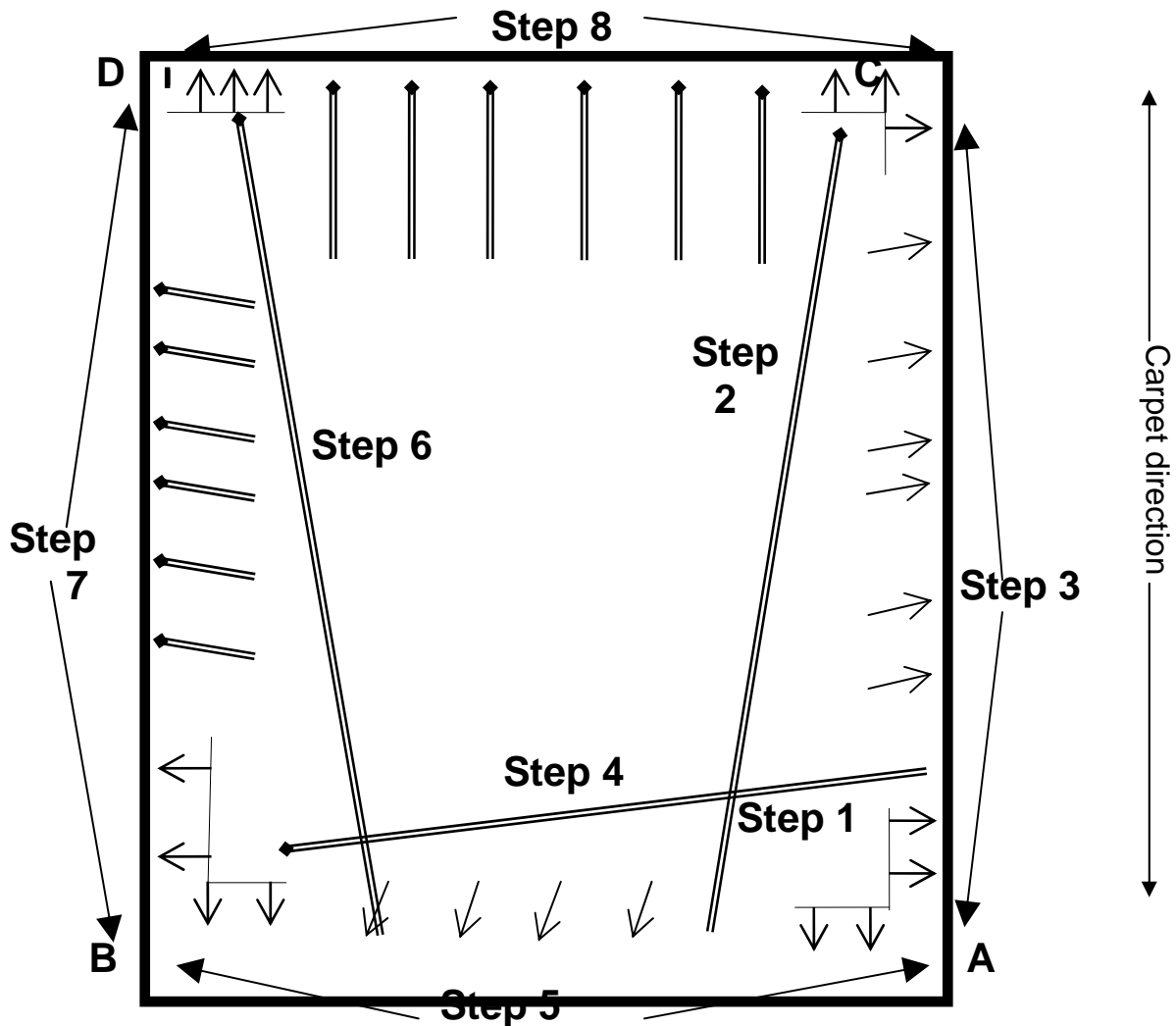
16.4 Seaming – The seaming method depends upon carpet construction and backing type. Always follow manufacturer recommendations for seaming. Common seaming methods include:

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

16.5 Power Stretching – Power-stretch carpet following the eight step procedure described in Figure 2. Firmly hook onto tack strip.

FIGURE 2 - Stretch Diagram for Tufted Carpet

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



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

16.5.1 Using a Mechanical Stretching Device (i.e. Power Stretcher) is Mandatory.

Devices used as a substitute for, or an attachment to such devices that penetrate through the carpet backing may cause injury, damage carpet or substrates, or result in inadequate stretch. Such devices are not acceptable.

Mechanical stretching device – A tool used to stretch carpet during the installation process. This tool is commonly referred to as a “power stretcher” or “carpet stretcher” and can be found in a number of forms. This tool should have all of the following:

1. A method to positively engage the carpet without slippage or damage – usually a pin plate or similar structure commonly referred to as the “stretcher head”.
2. A method to bridge between the “stretcher head” and a stationary structure – usually an opposing wall. This is typically a group of adjustable metal tubes ending in a padded plate.
3. A leverage or other type device that is capable of either supplying its own force or multiplying the force applied by the installer. This force is required to be sufficient to allow the carpet to be elongated by the amount required for the carpet being installed.
4. A method by which the elongation achieved can be locked and held in place.

CAUTION: Failure to mechanically stretch a carpet may result in:

- wrinkling and buckling over time
- localized damage to the carpet
- delamination
- Wrinkles and buckles most often are caused by: failure to adequately stretch carpet using a mechanical stretching device, using inappropriate or improperly installed cushion, adverse temperature and humidity conditions, or inadequate conditioning time.

16.5.2 Amount of Stretch – Due to the difference in carpet backing types, it is required that manufacturer recommendations for carpet stretch be followed. In the absence of specific recommendations, tufted carpet with synthetic backing should be stretched a minimum of 1% in length and in width. Patterned carpet may require additional stretch to obtain pattern match.

16.6 Finishing at Wall– Finish the installation along the wall, leaving a smooth, neat and secure transition. Trim carpet without damaging baseboards or moldings, leaving sufficient material for backing to be securely tucked into the gully without protruding face or backing yarns.

16.7 Transition Molding – Where carpet meets other floor coverings create a smooth transition and adequately protect edges with a transition molding that meets all carpet manufacturer and ADA requirements.

Note: Carpet placed into transition moldings requires edge sealing to prevent raveling.

17. Carpet on Stairs

17.1 Preparation – It is required that the stair tread, riser and stair nose should be clean, dry and structurally sound. The stair nose return should 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, extend the cushion over the stair nose.

17.2 Stretch-in Installation - Tack strip is to be installed on each tread. It is required that pins on the tread point toward the riser. On a waterfall-type stair installation, tack strip is to be installed on risers also. Pins on risers point down to the tread. It is required that the gully between strips be slightly less than double the carpet thickness. Where a turned finish is desired, tack strip and cushion are about $1\frac{1}{2}$ inches (38 mm) less than the carpet width, to allow for a turn under on each side of the stairs. Some stairs require tack strip on the sides to maintain the proper tension. When using a cap-and-band or contoured technique, tack strip is not used on riser.

Note: When staples are used in upholstering carpet on stairs, take care to separate pile yarns to avoid trapping yarns, resulting in visible distortion. If the edges are cut net, they must be sealed. Upholstery work needs to have no raw edges exposed. Any seams or joints must be sealed. Carpet seams need to be split in the direction of the balusters.

17.3 Glue-down Installation – Install carpet on stair treads and risers using recommended adhesive. Stairs without a return (nose) can be installed as one piece over the tread and riser. It is required that on stairs with a return, carpet be cut and installed with the tread and riser being separate pieces.

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

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

18. Modular Carpet

Follow carpet manufacturer recommendations regarding application, squareness and location of working chalk lines. Install modular carpet on 90° format with corners aligned according to manufacturer specifications. It is required that installation geometry (monolithic, ashlar, quarter turn, etc.) be agreed upon by all parties prior to installation.

18.1 Joints – Modules in the completed installation should be tight but not compressed. To insure proper spacing when installing modular carpet, measure the distance covered by 11 modules (10 joints) installed on the floor with no visible gaps, peaks or overlaps. Continually check that modules are being installed in compliance with manufacturer specifications for that particular product. Take care not to trap yarn between modules.

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

19. Patterned Carpet Installations

19.1 Uninstalled Patterned Carpet - Carpet is a textile fabric subject to inevitable processing variations in the four pattern conditions: bow, skew/bias, elongation variations and trueness of edges. Measurement of these four conditions is performed on an uninstalled breadth of carpet. Individual manufacturers have tolerances to which their patterned products are required to conform. There are no industry standards for carpet pattern variations.

19.2 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 experienced in the installation of patterned carpet can effectively make adjustments within manufacturer tolerances to provide a successful installation. To assist this process, clearly understand manufacturer tolerances. It is required that these tolerances be communicated and agreed upon by all parties prior to the specification, bid, purchase and installation.

Factors affecting 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, requiring the use of mechanical stretching devices and additional staffing, thus affecting the cost of installation.

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

19.4 Seaming Diagram – It is required that the seaming diagram reflect the desired pattern direction (6.1).

19.4.1 Patterned Carpet in Corridors - It is highly recommended that carpet with width-wise linear patterns not be installed breadth-to-breadth along the length of a corridor to avoid inconsistent alignment of pattern.

19.5 Roll Sequence - Roll sequencing information may be available from the carpet manufacturer. In the absence of roll sequencing information from the carpet manufacturer, sequence carpet cuts working from the longest measured repeat gradually down to the shortest repeat within the dye lot.

19.6 Carpet Layout – Lay carpet out according to the seaming diagram. Unroll carpet and allow it to relax for a minimum of 24 hours before installation. Pre-cutting of carpet is recommended.

Note: Patterned carpet may require additional material for proper pattern matching.

19.7 Seam Preparation – Refer to Section 8.

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

19.9 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:

- mechanical stretching device
- knee kicker
- dead man
- “dry” lines
- stay nails
- double-headed mini-stretcher (“crab stretcher”)

Note: For patterned carpet, exercise care to ensure pattern alignment along walls. The use of a mechanical stretching device, stay-nails and a “dead man” may be necessary to achieve pattern match at seams and alignment along walls.

20. Protecting Indoor Installations

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

20.2 Materials for Protection – It is recommended that carpet be the last trade on any job site. However, if it is required to protect the finished floor covering from soil or paint, or if additional work is required to be done after the installation, the carpet should be covered 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: Self-adhering plastic films may leave residues that result in rapid soiling after removal. Do not place plastic sheeting over any carpet installation because it may present a slip hazard. Most importantly, plastic coverings will trap moisture, retard adhesive curing and may promote mold growth.

20.3 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.

- 21. 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. 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.

- 21.1 Carpet Selection** - Carpet to be installed outdoors is required to be of the construction, and backing and fiber type recommended for outdoor use.
- 21.2 Site Conditions** – It is required that all installation surfaces be clean, dry, sound, cured, smooth and have adequate drainage. It is required that the temperature prior, during, and after installation be a minimum of 55°F (13°C) and a maximum of 95°F (35°C). Substrate temperatures are required to be between 65°F (18°C) and 85°F (29°C). If these conditions are not attainable, contact the flooring and adhesive manufacturer for applications to warranty.
- 21.3 Floor Preparation** - Carpet is required to be installed over properly prepared substrates that are suitable for the specific product and installation method selected. All cracks, holes and flooring irregularities are required to be repaired to ensure a smooth, finished appearance and prevent accelerated wear. Substrates are required to be structurally sound and free of foreign substances that will compromise the carpet or its installation. Patching compounds are required to be suitable for the use application. Select polymer-fortified patching compounds according to the carpet manufacturer's instructions.

Note: Check porosity. Patched areas may be non-porous and highly alkaline, which will prevent adequate adhesive bond. For best results, prime patched areas.

- 21.3.1 Wood** – Cover slotted wood surfaces with an outdoor-grade plywood and prime with a primer that is compatible with the adhesive selected. Joints in the substrate must be properly patched and prepared to prevent telegraphing of joints. 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.
- 21.3.2 Metal** – Clean metal surfaces of grease, oil, soil and rust, and properly primed. Prepare painted metal surfaces and remove loose paint appropriately. Aluminum surfaces should be sanded and cleaned with cleaner approved by the adhesive manufacturer immediately before applying adhesive.
- 21.3.3 Surfaces** such as terrazzo, ceramic and natural stone - Remove finishes and prepare flooring surfaces to ensure adhesion. These surfaces are required to be structurally sound and well bonded to substrate. Fill grout lines flush with approved cementitious leveling or patching compound. Follow the open time recommendations of the adhesive manufacturer when adhering carpet to nonporous substrates.

21.3.5 Asphalt – Asphalt requires special considerations as a substrate. Follow adhesive and carpet manufacturer’s recommendation.

21.3.6 Swimming Pools - Regardless of the surface encountered, indoor swimming pools should be drained and dry before installing outdoor carpet. Do not use outdoor pools during carpet installation. Remove fungus or algae from the surfaces to be covered. Ventilate indoor pool areas to reduce excess humidity. Follow manufacturer’s recommendation for proper adhesive use in this environment.

21.5 Adhesives - Adhesive selection is very important. It is required that carpet backings and substrates be compatible with the adhesive. Contact manufacturer for their adhesive recommendation.

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.

21.6 Acclimation – roll all outdoor carpet and allow to relax before installation according to manufacturer’s recommendation. It is required that this take place when the temperature is between 55°F and 95°F (13°C and 35°C).

21.7 Planning – Pre cut carpet for the area to be covered, allowing for required trimming. Keep seams to a minimum and run with the traffic pattern when possible. Where seams are required, be certain that the pile runs in the same direction on both sides of the seam. (Refer to Direct Glue Down Installation for specifications, Section 13.)

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

Appendices

Table I

Adhesives – Common Types Used in Carpet Installation

A. Carpet Floor Adhesives

1. **Latex Adhesive:** Common name for adhesives used to install broadloom carpets, excluding those with vinyl backing, either directly to a substrate or over underlayment and cushion. Refer to carpet manufacturer for adhesive grade recommendation for specific backings and uses.
2. **Multi-purpose Adhesive:** A latex adhesive designated for use with varying carpet types as well as non-vinyl backed (mineral-felt backed) resilient sheet goods.
3. **Vinyl-Back Carpet Adhesive:** Adhesive specifically formulated for permanent installation of vinyl back carpet.
4. **Modular-Carpet Adhesive:** Pressure sensitive type adhesive for releasable installation of modular carpets. Note: Always consult manufacturer for proper type adhesive.
5. **Outdoor Carpet Adhesive:** Water resistant adhesive for installations of carpet designed for outdoor use. Refer to adhesive manufacturer for adhesive grade recommendation for specific backings.
6. **Polyurethane Carpet Adhesive:** For installing specific polyurethane backings. Refer to adhesive manufacturer.
7. **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)

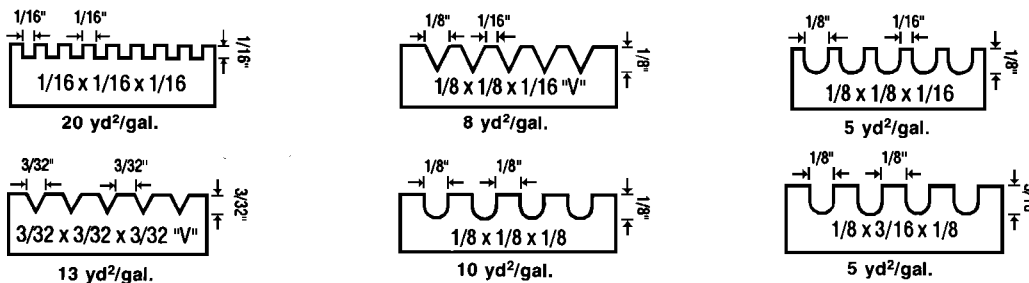
1. **Vinyl-back Seam Adhesive:** Solvent-based (chemical weld) or solvent-free (mechanical bond).
2. **Latex Seam Adhesive:** For applying seaming tapes, reinforcing sewn seams, sealing trimmed edges prior to “hot melt” seaming, securing binding, etc.
3. **Hot Melt Seam Adhesive:** A thermoplastic adhesive used for adhesive or stretch-in applications.

Table II

Trowel Size – Minimum Guidelines				
Direct Glue Down				
	Trowel Size (in inches*)			
Type Carpet Back	Notch Width	Notch Depth	Space Between	Notch Shape
Polypropylene, woven mesh Secondary	1/8	1/8	1/16	V
	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			
Double Glue-Down				
Cushion to floor	1/16	1/16	1/16	□
Carpet to cushion: -smooth back carpet	1/8	1/8	1/16	U
	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.



Actual size trowel notch and reasonable expected spread rate ranges.

- 1/16 x 1/16 x 1/16 sq = 15 – 20 yds.²/gal.
- 3/32 x 3/32 x 3/32 V = 10 – 15 yds.²/gal.
- 1/8 x 1/8 x 1/16 V = 8 – 10 yds.²/gal.
- 1/8 x 1/8 x 1/8 U = 6 – 10 yds.²/gal.
- 1/8 x 1/8 x 1/16 U = 5 – 8 yds.²/gal.
- 1/8 x 3/16 x 1/8 U = 5 – 8 yds.²/gal.

Guidelines for Maintaining Indoor Air Quality During Carpet Installation

- During installation, maintain air circulation by operating the HVAC system at full capacity.
- 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 Seal of Approval “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 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 Green Label Plus 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 carpet in a well-ventilated area for 24 hours or more before installation.



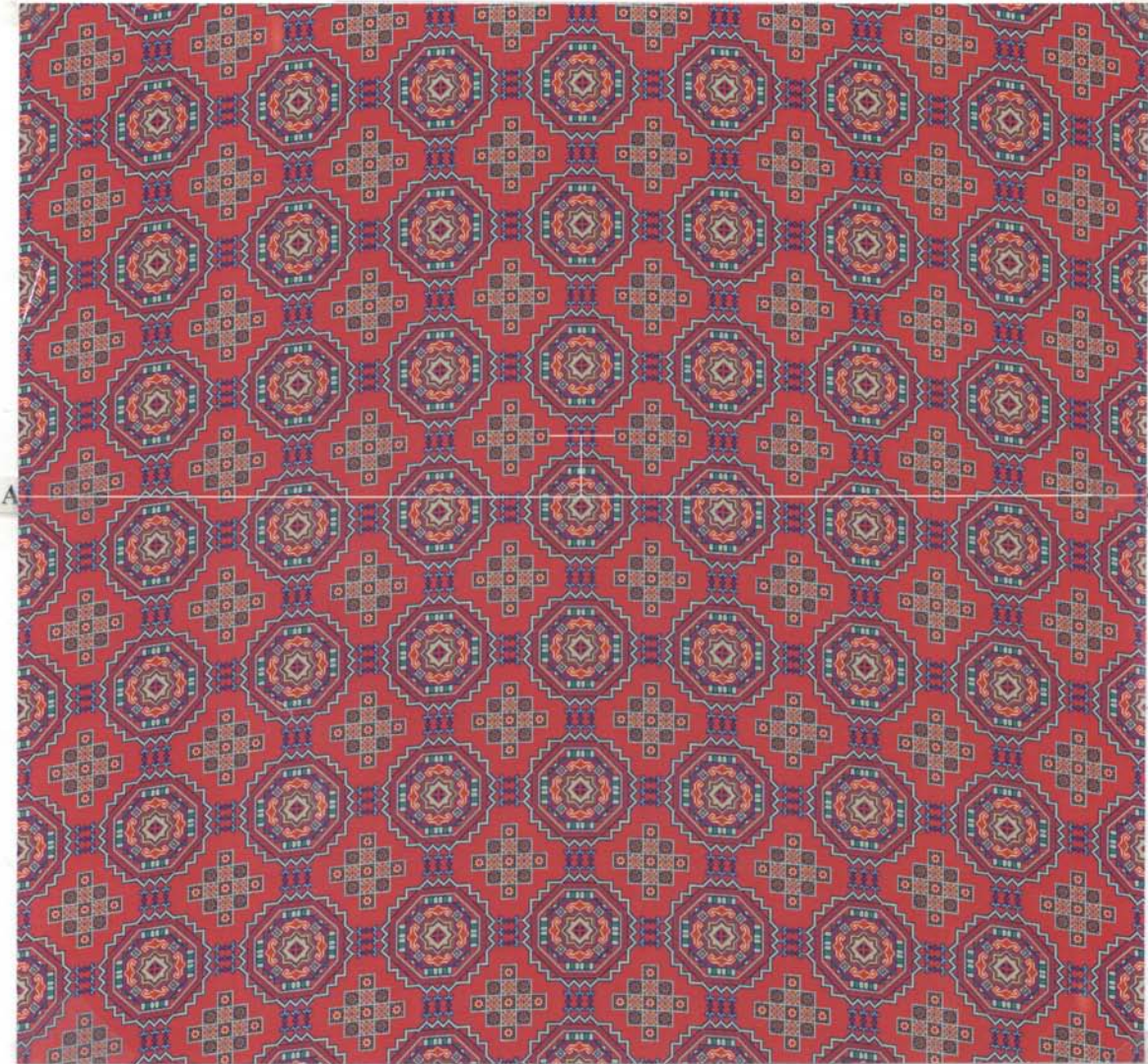
Look for and purchase carpet, carpet cushion and floor covering installation adhesive products that display the Carpet and Rug Institute (CRI) Indoor Air Quality label. These three indoor air quality testing programs identify the products that have been tested and meet stringent indoor air quality requirements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

**PATTERN REPEAT VARIATION (LENGTH OR WIDTH)
18" X 18" SET MATCH IN THIS EXAMPLE**



MEASURE THE SPECIFIED NUMBERS OF REPEATS (8 FOR THIS EXAMPLE) AND REPORT DISTANCE COVERED. USE THIS DISTANCE AS A SEQUENCING GUIDE.

**PATTERN BOW (WIDTH)
TRUENESS OF EDGE (LENGTH)**



Isolate Points "A & B" as directed in the document. Connect these points with a tightly stretched string as indicated by the white line. Pattern Bow (Width) is the distance between the string and the pattern at the point of greatest separation. Indicated here by the White "T".

The same general procedure is used to measure trueness of edge. For that measurement Points "A" and "B" are on the same lengthwise pattern line at least 40' apart. Edge trueness is the distance between the string and the pattern

PATTERN BIAS

ISOLATE POINTS "A" AND "B" AS DIRECTED IN THE DOCUMENT. NOTE THAT THESE ARE POINTS LYING ON THE SAME WIDTHWISE PATTERN LINE AS CLOSE TO THE TWO SELVAGES AS POSSIBLE. IN THIS EXAMPLE THEY ARE THE SAME POINT WITHIN THE PATTERN. POINTS "C" AND "D" ARE ESTABLISHED BY MEASURING EXACTLY 9' UP THE EDGE OF THE CARPET ALONG THE LENGTHWISE PATTERN LINES CONTAINING POINTS "A" AND "B".



MEASURE DISTANCE AC AND BD AS SHOWN. DIFFERENCE BETWEEN AC AND BD IS REPORTED AS "DIAGONAL DIFFERENCE".

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 base properties and having a pH greater than 7.
- attached cushion** – Cushion material permanently bonded to the back of carpet and rugs by the manufacturer.
- baseboard** – A board skirting the lower edge of a wall, covering the junction of the wall and the floor.
- bow** – A distortion visible as wavy or crooked lines when viewed across carpet width or length.
- calcium chloride test** – ASTM F1869 test method that is used to obtain measurements of moisture vapor emission rates over concrete substrates.
- carpet cushion** – Material placed under carpet to provide resiliency, support, insulation qualities and noise reduction. Also referred to as carpet lining, padding, or underlay, although “carpet cushion” is the preferred industry term.
- conditioning** – The process of allowing the substrate, carpet, cushion and sundries to relax or acclimate to the proper environment into which it is to be installed as described in the text.
- 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 tack strip attached to the bottom side.
- direct glue down** – An installation method whereby the carpet is adhered to the floor using the proper adhesive.
- 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 using the proper adhesives.
- Double-headed mini-stretcher (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.
- dry line** – A length of line or cord, which is stretched slightly above the carpet, but not touching the carpet, and used as a visual reference in pattern alignment. Lasers also may be used in this capacity.
- gully** – The distance between the tack strip and the wall. A gully should always be slightly less than the thickness of the carpet and not exceeding 3/8 inch.
- HVAC** – Acronym for “heating, ventilating, and air conditioning” referring to indoor climate control systems.
- knee-kicker** – An installation tool designed to position carpet and move it onto the tack strip. [NOTE: With the exception of stair installation, knee-kickers should only be used for positioning and hooking the carpet onto the tack strip and not for stretching carpet. A power stretcher, i.e. mechanical stretching device, should always be used for stretching carpet during installation. See definition of power stretcher.]
- modular carpet** – Curious shapes and sizes of carpet precut during manufacturing with applied backings. Backing materials include thermoplastic PVC, polyethylene, polyolefin, bitumen, polyurethane and other compositions for cushion and dimensional stability. Also referred to as “carpet tiles.”
- needlepunched carpet** – carpet made of a dense network of yarn fibers having a

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

patching – Floor preparation process of filling holes, cracks, and imperfections, 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 (base) 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. [Use distilled water for laboratory and field testing for pH.]

power stretcher (i.e. mechanical stretching device) – A carpet installation tool used to stretch carpet for installation on the tack strip. 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.

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 and protecting 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 (edge sealing) – Common term used to describe the application of seam adhesive to secure and protect cut edges of carpet to be seamed from edge raveling and delamination.

seaming tape – 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 the floor/wall line junction or between larger moldings and floors.

stair nose – leading edge of a stair tread. For carpet installation, it is required that this edge be rounded.

stay nailing – A technique of temporarily fastening carpet to the floor using nails to prevent movement until permanent fastening with tack strips, adhesives, or other means is possible. This technique is commonly used to align patterned carpet.

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

tack strip – Wood 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.

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

transition 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.”

tread – The horizontal part (walking surface) of a stair.

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

trueness of edge – Also referred to as lengthwise pattern bow. It is generally measured as maximum deviation from a straight line, over a defined distance, between common pattern points along the machine direction of the carpet.

tufted carpet – Carpet manufactured by the process of inserting pile yarns into a primary backing fabric through needles.

unitary carpet – Carpet backcoated with a compound intended to increase physical properties normally without the addition of a secondary backing.

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

working time (may be referred to as slip time) – The length of time available after covering the adhesive with carpet to make adjustments or manipulate the carpet.

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.