

INTERNATIONAL



CERTIFIED FLOORING INSTALLERS

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# **CARPET INSTALLATION TRAINING and CERTIFICATION**

*for professional flooring installers and industry associates*

**Presented by the CFI Team of Instructors**

*and*

**Members of the Manufacturer Sponsors' Technical Departments**

These guidelines are designed to achieve the utmost in customer satisfaction by following industry standards and adhering to the manufactured installation specifications.

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Disclaimer: The information contained in this handout is to be used as recommended guidelines. It is based on the best information available at the time of publication; always subject to revision. No guarantees are made as to results and CFI assumes no liability or responsibility in connection with the use of the information. It is suggested that you test all procedures before widespread use to determine results in your specific situation, as every circumstance is different. Information is provided as a guide and is not intended to take the place of good judgment, common sense or the manufacturer's written guidelines. ALWAYS follow adhesive, cushion and carpet manufacturers' guidelines.

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## **CFI Mission Statement.....**

*CFI exists to elevate, promote, and represent the professionalism of Flooring installation.*

### **CUSTOMER SATISFACTION!**

#### **LOGO: PRIDE**

*Professionalism, Responsibility, Integrity, Dependability, Education*

## **1) Why CFI?**

CFI is the official organization for professional flooring contractors who:

- Seek identification as professionals
- Are proud, professional, quality-minded individuals
- Desire education and updated information
- Seek access to tech service and problem solving assistance
- Are searching for achievement of economic self-sufficiency
- Desire a connection with multiple industry resources
- Seek advancement of the flooring installation trade
- Are willing to communicate to build commitment within the trade
- Seek professional development

## **2) Designations of Certification**

### **CARPET**

- Entry Level Skills and Knowledge – Minimum 2 yrs. exp. Residential-I Commercial-I
- Advanced Skills and Knowledge – Minimum 4 yrs. exp. Residential-II Commercial-II
- Advanced Commercial Carpet – Knowledgeable in all carpet applications - Minimum 6 yrs. experience
- Master-II – Updated Master Certification – Minimum 10 yrs. experience

### **HARD SURFACE**

- Designed to promote the skills of hard-surface flooring professionals
- CFI-Armstrong-NWFA Finished **Wood** Certified Installer Program
- CFI **Ceramic** Certified Installer Program
- CFI Commercial **Resilient** Certified Installer Program
- *Presently accepting membership from*
  - 1) Armstrong Certified Installers with completion of Armstrong Certified Installer Program
  - 2) National Wood Flooring Association (NWFA)
  - 3) Pergo Endorsed Installers with completion of Pergo Endorsed Installer Program
  - 4) Ceramic Tile Education Foundation with completion of specified programs

## **3) Benefits of Certification**

- Legitimizes the flooring installation trade
- Promotes professionalism and integrity - Instills customer confidence
- An incentive package to “sell” customer
- Member of a network of like-minded individuals
- Increased educational resources
- Tech-line and problem solving assistance
- Marketable to consumers, contractors, architects, designers, specifiers, etc.
- CFI Membership benefits – WFCFA, Prepaid Legal, Clothing, Training, etc.
- Website [www.CFIInstallers.com](http://www.CFIInstallers.com), online installer listing, eNEWS, “The CFI Professional”
- Facebook, Networking connection with multiple resources

**Motto:** If it is to be, it is up to me

**Slogan:** Together, we make a difference

## **4) How does the Certification benefit the Industry?**

- Provides awareness of trade professionals for consumers and the industry
- Builds a bridge with the dealer / architect / specifier / inspector / claim representatives
- Provides updated info, new technology, tools through “The CFI Professional”
- Builds effective relationships
- Improves customer satisfaction
- Improves performance and effectiveness as a group
- Strengthens the industry as a whole

## Section I CFI Mission Statement

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### **CFI exists to elevate, promote, and represent the professionalism of Flooring installation**

The International Certified Flooring Installers Association, Inc. (CFI) was founded in November of 1993 and continues to grow at an unbelievable pace nationwide and in several foreign countries with over 42,700 trained and certified prior to 2012. A minimum of 65 CFI Training and Certification events are conducted annually. CFI Chapters provide a source for continuing education, problem solving and the sharing of ideas between professional commercial and residential Installers. Information can be accessed through [www.CFInstallers.com](http://www.CFInstallers.com) and through the *CFI Professional News* and the *CFI eNews*.

CFI offers to the commercial or residential customer who is purchasing new flooring, an opportunity to engage the services of an individual who is an installation specialist, who guarantees the work and leaves the home, office or business with the assurance of a worthwhile and lasting purchase. CFI installers have signed an agreement that the installation will be performed in accordance with the CFI Proven Methods of Installation, the manufacturer guidelines and the Carpet and Rug Institute CRI-104 and CRI-105. If a problem should occur, the CFI installer returns promptly to rectify the installation issue. CFI installers leave the home or business in a manner that showcases the beauty of the new flooring purchase.

## 1. WHAT IS CFI?

**CFI, the International Certified Flooring Installers Association** was founded in 1993. In 2023, the organization represents over 60,000 carpet installers worldwide who regard customer satisfaction as the ultimate goal. The customer has the opportunity to select the best-qualified installer in their area by visiting [www.CFInstallers.org](http://www.CFInstallers.org) and entering a zip code in the search box. The categories of certification determined by skills, written and oral testing are Residential-I and Commercial-I, Residential-II and Commercial-II recommended for installations requiring more experienced technical skills. Advanced Commercial Carpet and Master-II designation describes those qualified in all areas, including woven carpets and specialty materials.

Through attendance at the CFI Training Sessions, the installers are not only provided with the skills and knowledge to enhance their value but also the opportunity to earn the designation of a CFI Residential-I Carpet installer. By demonstrating the skills and knowledge required to earn certification, the installers participate in two days of “hands-on” training conducted by the CFI Team, recognized by the industry as the most qualified in the nation. CFI Certification builds effective relationships, provides updated information and new technologies, improves customer satisfaction and performance, and strengthens the industry as a whole. The value of joining a group of others who proudly display their skills daily is brought to you by your installation partner. They also have the opportunity to attend CFI Certifications in their area to achieve advanced levels. Earning CFI Certification is just the beginning. Delivering customer satisfaction on a daily basis is the journey.

The technical staff at CFI is always prepared to assist with answers to situations that arise and offer solutions to rectifying problems should they occur. By calling (816) 231.4646, installers who have attended the CFI programs can discuss the work prior to the commencement of the job or seek advice as the job progresses.

This is a service that is available to CFI Installers and a benefit of membership.

CFI Certified Installers receive “The CFI Professional,” CFI eNews, discounted fees to all educational events, opportunity to attend other CFI events to achieve the advanced levels of certification, CFI ID badge and certificate and a listing on [www.CFInstallers.org](http://www.CFInstallers.org)

Questions are always welcome during the training. At this event, installers receive the opportunity to earn the CFI Residential-I Certification if proof of **two-years of active installation experience** is presented.

**A. To receive the R-I and/or the C-I designation, the installer is required to**

- Show proof of active installation experience for a minimum of 2-years.  
Proof must be received in the CFI office prior to mailing the CFI badge and certificate.
- If this time frame is not met, the certification is held until the installer submits verification to the National CFI Office.
- Installer must demonstrate the skills required during the training program, successfully complete the written test and sign the CFI Professional Installer’s Agreement

**B. To receive the R-II and/or the C-II designation, the installer is required to**

- Show proof of active installation experience for a minimum of 4years.  
Proof must be received in the CFI office prior to mailing the CFI badge and certificate.  
Complete the requirements of R-I and C-I prior to testing for the advanced levels
- Thoroughly understand the CFI Advanced Study Guide information

**C. Advanced Commercial Carpet and Master-II Certification**

- These are an intensive three-day knowledge and skills program covering all aspects of carpet installation, including woven materials and hand sewing techniques in the master program, and extensive pattern matching in the ACC program.
- The highest level of certifications available in the flooring industry

**D. The CFI Certified Installer receives**

- The CFI R-I Identification Badge
- CFI Certificate of Certification
- CFI Decal for display on truck or toolbox and purchase of additional decal for \$2.00
- Opportunity to purchase the CFI shirt with logo.
- Listing on [www.CFInstallers.org](http://www.CFInstallers.org) website and in the CFI Directory
- The CFI Professional Newspaper and/or CFI eNews by Internet
- Opportunity to attend all educational events and CFI Convention at member fees
- Annual renewal notice to maintain certification for \$120.00 per year to be recognized as a certified flooring professional in the industry. Dues are included for the first year.

***Welcome aboard!***

CFI looks forward to working with you to increase your value through education and advanced training.

## SECTION 2 – Introduction to the course

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### A. CFI – Manufacturer’s Partnership

Flooring installation is a serious business! The CFI Partnership is built on creating an environment in which the customer receives what is expected at the time of the sale; that is quality work provided by professional CFI Certified Installers with the ultimate in customer service skills. The sales associates and flooring installers make this happen by sharing skills and knowledge. Working together to create this scenario, the customers return again to purchase flooring that results in a “hassle-free” experience to beautify the surroundings of their homes and offices.

### B. Recognition of the Program Sponsors

This training is made possible through the generosity of the flooring industry. Supplies are donated by:

Mohawk	Traxx	Taylor Adhesives
Robert’s	QEP	Crain Tools
Floorcloud	Base King	Enviro Stix Adhesives
Beno J Gundlach	Ardex	Schonox
Wagner	Mapei	

### C. CFI Team of Trainers

The CFI Team is composed of over 75 trainers who complete extensive skills and knowledge testing to present the most up-to-date installation knowledge. It is presented in a format that provides installers and sales associates with information that will enhance their customer service skills. The Team also includes technical installation representatives from the carpet manufacturers. Professional installation is the answer to the customer’s search for a carpet installation that not only beautifies their surroundings but is performed in a manner in which the customer feels safe, secure, and satisfied during and after the flooring purchase.

### D. Review of the Program

1. Installation training includes the Koolglide Certification using the latest radio-wave technology to construct seams, match patterns, repair carpets, and remake seams immediately on the job site.
2. It also includes seam preparation and construction, patterned carpet matching techniques and tolerance information, upholstery work without the use of staples, and tips for building a partnership with the sales team. Installer hands-on skill sessions are scheduled throughout the event.
3. For the sales associates who attend, the CFI Sales Associate Carpet Certification presents the latest installation methods, customer preparation, and information concerning installation pertaining to the sale and developing a partnership with the installation professionals.

## E. The CFI Flooring Sales Installation Partnership

**The CFI Sales Associate Carpet Installation Certification** is awarded to sales associates participating in the two-day training program and completing the written test. Information such as installation selling techniques, estimating and measuring, and problem solving are also included in their portion of the program.

**The best installation begins at the time of the sale!** The carpet sales representative's relationship with the customer transforms into a contract for sale when he or she "promises" their company's reputation and experience when they "sell" the carpet. Once it arrives, the continuing relationship is placed in the hands of the installer. The installer's obligation as a representative of the firm is to preserve the customer's confidence throughout the installation period. The installers complete the sale and can "sell" or "unsell" everything based on their work quality and attitude. Unprofessional installers can destroy future sales in a very short time.

Quality workmanship is not everything! Equally important is the observance of good, common-sense rules of conduct on the customer's premises during the installation process. A well-qualified installer is usually a business-like worker and skill and neatness generally go hand-in-hand. Good conduct is bigger than neatness and skill. In the field of carpet installation, the customer is not likely to overlook questionable conduct or bad manners no matter how expert the job turns out. The installer may create such a disruptive atmosphere that the job cannot be completed.

## SECTION 3 – Setting the Stage with the Customer

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Flooring customers make an investment in their lifestyle. They expect a professional and enjoyable experience that a professional, quality-minded, and skilled installer can deliver. Let's look at this from the customer's side. Customers want workers in their homes or offices that possess positive factors that include their appearance, prompt arrival time, communication skills, respect for their furniture and fixtures, attitude toward others, honesty and quality of service and ability to leave the jobsite in a manner that enhances the beauty of their surroundings.

**Professional installation professionals seek to achieve** the status of top-quality certification and receive the edge and confidence to perform the finest installations. They are searching for recognition as one of the "BEST." The skilled installers display the pride and professionalism that only come from a sense of achievement and recognition of a "job well done!"

Professionals **NEVER** display attitudes that in any way create a negative perception of the installer, the sales associate, or the retail establishment. They avoid becoming the "salesperson" for the job – installers do not know what was said at the time of the sale. The best answer for the customer is, "Contact your sales associate."

CFI stresses pride, professionalism, attitude, skill, and knowledge, which help you to work with dealers, contractors, and customers. **You never get a second chance to make a good first impression!** Customers want to open their door to neat appearing, polite and well-groomed installers. Today, more than ever they want to feel safe and know that you will provide them with an installation of which they can be proud.

**CFI promotes pride and professionalism.** *The following practices make your day go smoother.....*



## **Arrival Time**

Prompt arrival at the designated time is the way to start a positive relationship. If you find that you will be arriving later than specified, call. Be on time!

## **Arrive Prepared**

ALWAYS be prepared! Keep the truck stocked with supplies and maintain your equipment to avoid unnecessary trips.

## **Appearance**

Professional installers display personal neatness such as well-groomed hair, clean-shaven or neatly trimmed beard, odor-free, wearing clean shoes free of mud or dirt, and installation clothing in a clean condition that does not require repair or display holes in the knees. All contribute to a display of respect for the customer.

## **Attitude toward the customer**

Greet the customer with enthusiasm; introduce yourself and your co-worker. The way we respond to others affects the manner in which they respond to us. Be considerate and polite! You are in the customer's "castle." Treat it accordingly. No smoking. No music. Avoid using the customer's bathroom, broom, vacuum, trash bags, kitchen and personal items.

## **Attitude toward others**

Conversations with other workers should always be professional, never demeaning or loud. Address your co-workers in a business-like manner. No foul language, off-color jokes or rudeness. No one wants to hear about your personal problems.

## **Ask permission**

Ask permission to park your vehicle in a specified area. Always be considerate of the customer's surroundings. If the truck leaks, place a carpet scrap or cardboard under it to protect the customer's property. Avoid parking in the customer's driveway.

## **Avoid controversy**

Your job is to install flooring! Do not discuss color, type, quality, cost or any item that is the responsibility of the salesperson. The answer if questioned is, "I suggest you contact your salesperson." Never talk about the dealer or the sales associate!

Check to be certain you have the right carpet and it can be correctly installed **BEFORE** you remove the existing store personnel if patterns are out of tolerance, if a manufacturing defect is evident or other problems surface that are out of your control. If a problem arises, handle it immediately without involving the customer if possible.

## **Show respect and concern for the customer**

Review the areas to be covered, discuss the seaming diagram and all information pertinent to the job **BEFORE** you begin work. Bring to the customer's attention damaged wood, scratched walls, torn wallpaper, scratched or broken furniture. NOTE these items on the work order for future review.

## Follow the manufacturer's installation guidelines

Install all types of flooring following the manufacturer's guidelines. When reviewing the job, if you have questions, contact the mill's technical department for assistance. If no one is available, call the CFI office.

## Leave the surroundings a place of beauty

Clean the area! Never leave a mess! Vacuum the area! Bag the scraps! If included in the sale, remove and replace the furniture and fixtures with care. The customer's perception of NEW flooring includes a beautiful area. Why ruin this? If there are concerns, dealing with them at this time is much less costly than a callback. Customers have purchased a finished job! Review the installation and make sure it meets their expectations.

## Expectations of CFI Installers

Installers as a group accomplish more than one individual in the field of promoting quality installation. CFI installers present themselves at all times as professionals with actions that are above reproach, exhibiting dependability, integrity and honesty. No question should ever arise concerning their actions. CFI Installers create a lasting impression with genuine concern for the job and the understanding that **Customer Satisfaction is the Ultimate Goal!**

# SECTION 4 Carpet Construction – Cushion – Backings - Tools

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## 1. IDENTIFICATION OF CARPET CONSTRUCTION

Because of the various manufacturing methods that are used, the end product can be difficult to identify as to the type of weave or construction. There are numerous types, but this course addresses tufted carpet.

### TUFTED

Tufted carpet is traditionally identified on the reverse side, where it is often possible to see the even rows of tufts punched through the prewoven kraftcord or jute backing.

## 2. BACKING

The backing of the carpet secures the yarns in place and provides the foundation. It is coated with latex to seal in the tufts. Identification of the backing – pick of the back

“**PICK**” of the backing is described as the number of **weft (widthwise)** yarns shuttled across the **warp (lengthwise)** yarns that indicates the closeness of length weaves. A **larger** pick number and a **closer** weave = **backing of higher quality**.

*Examples:*

5 pick backing = larger areas in backing that allow the "fillers" to fall through

12 pick backing = smaller areas that keep the fillers and backing intact.

**WARP** identifies the LENGTHWISE yarns (Star Wars – straight ahead)

**WEFT** identifies the WIDTHWISE yarns that are shuttled across the warp yarns (left to right)

### 3. CUSHION plays an important role

The manufacturer's specified cushion must be installed under the carpet type to achieve a satisfactory installation that holds the stretch. Looseness that results from an installation over the improper cushion is NOT an installation problem. Cushion seams are NEVER placed directly under carpet seams. The cushion must be properly secured to avoid movement during the powerstretching procedures.

### 4. Tools of the Trade – Carpet Installation Residential R-I

Air mover – circulating fan	Koolglide seaming tool and tape	Seaming weight
Broom and dust pan – hand broom	Lifter - molding	Seaming iron and tape
Camera	Moisture/substrate testing equipment	Shears
Cutter – Cushion-back	Pouch	Spot remover
Cutter – Loop-pile	Powerstretcher, poles, cottonhead	Square
Deadman	Restretcher – pattern stretcher	Stair Tool
Door pin remover	Roller – Smooth 6-inch	Staple hammer - staples
Dry line - Chalk line and chalk	Roller – Starred 6-inch	Stay nails for pattern alignment
Extension cords	Row finders – awl, knitting needle	Straightedges
Furniture and appliance movers	Rubber mallet	Tackstrip cutters - tackstrip
Glue gun, tips and glue sticks	Scrapers and blades	Tape Measure
Ground fault circuit interrupter	Screwdrivers – slotted / Phillips	Tool boxes
Hammer	Seam Latex and bottles	Touch-up set – putty/coloring sticks
Knee kicker	Seam Sealer and bottles	Trash bags
Knee pads	Seam solvent	Vacuum (extra bags if needed)
Knives and blades	Seaming board (under seam use)	Wall trimmer and blades

**\*\*\*Additional tools are necessary to achieve the R-II and Master-II levels of certification**

Visit [www.CFInstallers.com](http://www.CFInstallers.com) for information

## 5. Directions to construct a “DEADMAN”

- a. Start with a 2’ x 12’ that is six-feet in length
- b. Draw a line around the 2’ x 12’ that is one-inch from the outside of the board. This area, which is void of tackstrip, is designed for easy handling of the “tool.”
- c. Cover inside area completely with standard or one-inch wide tackstrip
- d. Point all tackstrip pins facing the same direction.

### ***DIRECTIONS FOR USE***

- a. Position the carpet in the room and begin pattern matching in the center of the seam.
- b. Begin seaming IN THE CENTER OF THE CARPET.
- c. Lay THE DEADMAN face (tackstripped side) down across a matched portion of the pattern.
- d. Slant pins away from the direction in which you will stretch
- e. Pattern run-off will be evident when looking down the seam.
- f. Position the powerstretcher in front of THE DEADMAN on carpet where pattern appears shorter.
- g. Extend powerstretcher the necessary length and stretch to match pattern
- h. Perform this task in small increments
- i. Installer’s assistant must stand on THE DEADMAN.
- j. Stretch the short pattern and align with the other side of seam.
- k. Commence seaming where the pattern is matched
- l. Use stay nails to hold in place while the hot-melt seaming tape is cooling
- m. Reposition THE DEADMAN where the pattern was last matched.
- n. Duplicate the procedure until the seam is completed
- o. Reverse the procedure for the opposite end of the seam

Using the *DEADMAN*, the installer can match patterns of various construction types, including attached cushion. It is also a tool for installing direct-glue or double-glue patterned carpets. It can be used as a wall to stretch from during installation to avoid damage to woodwork and glass walls.

## **Section 5 - Installation Knowledge – The CFI Study Guide**

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The CFI Team shares the proven methods of carpet installation that work for thousands of installers worldwide. We also invite you to share with us methods that work for you. Techniques that are demonstrated have proven to provide the customer with the highest degree of customer satisfaction.

### **Topics include:**

1. Carpet construction – backings – using the appropriate cushion
2. Seaming – seam location – seam preparation – Koolglide Seaming System
3. Patterned carpet – tolerances – pattern match
4. Stair upholstery without the use of staples
5. Powerstretching and wall-trimming techniques
6. Professionalism and customer satisfaction

The CFI Study Guide is widely used throughout the Industry as a “tool” for understanding the requirements of a successful carpet installation. The Carpet and Rug Institute’s CRI-Commercial Standard CRI-104 and the Residential Standard CRI-105 are also manuals that assist in the installation of carpet and can be downloaded at [www.carpet-rug.org](http://www.carpet-rug.org). By acquainting yourself with the CFI Study Guide and Terms, the written test that is administered at the close of the event is not difficult. The answers to the test are provided in the study materials.

## CFI PROVEN METHODS of INSTALLATION – CFI CARPET STUDY GUIDE

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### THE CFI INSTALLER

1. **CFI Certified Installer** is identified by shirt and ID Badge and proudly displays CFI logo
2. **CFI Certified Installer** is dressed in a professional manner; no torn clothing or offensive logos
3. **CFI** logo is worn or displayed **ONLY** by those who are **certified**. It is earned!
4. **CFI Certified Installer** answers recalls in timely manner, preferably within 72-hours
5. **CFI Certified Installers** guarantee all labor for a minimum of one year
6. CFI Certified Installer is requested to attend local CFI Chapter Meetings if available in area.

### GENERAL KNOWLEDGE

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1. **CRI** Carpet and Rug Institute, the manufacturer's organization that is located in Dalton, GA
2. **CRI-105** Guide to Residential Carpet Installation prepared by the Carpet and Rug Institute
3. Individual manufacturer's installation guidelines supersede the CRI Guidelines
4. Water applied to synthetic carpet backing will **NOT** cause shrinkage, but encourages delamination.
5. Carpet stored more than 3 rolls high may be the cause of crush marks.
6. The "**pick**" of the backing is described as the number of **weft (widthwise)** yarns in one-inch that are shuttled across the **warp (lengthwise)** yarns that indicates the closeness of the width weaves.  
A **larger** pick number and a **closer** weave = a **backing of higher quality**  
*Example: 5 pick backing* = larger areas in backing that allow the "fillers" to fall through  
*12-pick backing* = smaller areas that keep the fillers and backing intact
7. Cushion of **7/16"** height is recommended by CRI-105, but no higher than ½" for residential installation. There is no stated density unless written by the carpet manufacturer.
8. When measuring, allow **3-inches** over for **EACH cut**. For patterns, add full pattern match to width and length.
9. Installer is to receive a **detailed diagram** showing placement of seams
10. Plastic sheeting should not be used over any type of installation as it may trap moisture, retard the curing of adhesive or promote the growth of mold and mildew.
11. The **selvage** edge of the carpet is the factory-finished edge of the carpet
12. Allow the carpet to acclimate or adjust to room temperature as long as possible for the ease of installation. Check with manufacturer for specifics.
13. Pile direction runs **LENGTH** of the stair unless the pattern is to be matched on the floor below.
14. The spike is **NOT** an acceptable tool
15. Run carpet in hallway lengthwise with a minimum number of seams
16. **Axminster** is a woven carpet

### INSTALLATION TECHNIQUES – FOLLOW MANUFACTURER GUIDELINES

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1. A **continuous** section of carpet is to be installed through spindles of the step
2. When installing carpet on stairs, start at the bottom and work to the top
3. Secure cushion with staples or cushion adhesive except fiber cushion - secure seams with appropriate cushion tape. **Do NOT use duct tape on cushion seams**. Duct tape is recommended on the edge of the cushion installed over the nosing of the step to protect the cushion.
4. Cushion must cover bullnose of stair regardless of the type of stair treatment.
5. **Never** install carpet over existing carpet UNLESS manufacturer states otherwise

### SURFACE PREP – FOLLOW MANUFACTURER GUIDELINES

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1. For a fee, subfloors must be properly prepared. All cracks, holes, joints and protrusions must be adequately addressed to ensure a smooth, finished appearance.
2. There is usually a minimum of **18"** of air space under wood subfloors – refer to local codes.

3. On-site temperature required 48-hours prior to & during installation is usually between **65-95 degrees** to be maintained for at least **72-hours** following installation. Slab temperature shall never be less than **65-degrees**. Inside temperature **NEVER** falls below 50-degrees to ensure the quality of the installation.
4. Alkalinity = A **pH reading above 9** requires corrective measures for direct-glue installation.
5. Moisture tests should be performed **before** installing over existing resilient tile or concrete – use ASTM Standards.
6. It is recommended that the **Owner** or **General Contractor** submit to flooring contractor a written report on moisture and alkalinity ratings of the slab to determine if substrate is suitable PRIOR to installation according to the industry-accepted WHITE PAPER.
7. If a **powdery or overly porous surface is present**, use a primer compatible with the adhesive to provide acceptable surface for a direct-glue / double-glue installation.
8. Mix floor patch and apply according to manufacturer's recommendations
9. Do **NOT** apply adhesive over existing sheet vinyl, solid vinyl tile and certain rubber products. Consult manufacturer for correct installation procedures
10. The use of liquid adhesive removers may void applicable warranties. **CHECK!**
11. **Minimum of 90-120** days is required for curing of concrete slab to reach acceptable dryness for installation of carpet.
12. Generally, for adhesive installations, a moisture emission rate above **5 pounds in 1000 square feet in 24-hours** is considered unacceptable. Consult the manufacturer for specific details.

#### **CUTTING, SEAMING, SEALING SEAMS – FOLLOW MANUFACTURER GUIDELINES**

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1. Whenever possible, seams are positioned **away** from the traffic areas.
2. Main traffic runs parallel to rather than across the seams.
3. Whenever possible, natural light should not strike **across** seam.
4. Seams should be kept away from areas that receive **pivotal traffic**.
5. Whenever possible, do **NOT** construct seams perpendicular to the **doorway openings**.
6. A maximum of **2 crossgrain seams** is acceptable per fill section.
7. It is always important that the customer is aware of seam location.

#### **SEAMING TECHNIQUES – FOLLOW MANUFACTURER GUIDELINES**

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1. Seams are a reflection of you and your skill. Proper techniques achieve customer satisfaction.
2. Seal **ALL** seams with appropriate sealer UNLESS manufacturer's directions state otherwise,
3. Correct iron temperature is essential—depending on type of seaming tape, iron and carpet.
4. Carpet construction and type of backing will determine type of seaming tape to be used.
5. Most carpets are **cut from the face**, not from the back.
6. When carpet is cut from the back, low rows of yarn may appear if knife blade cuts too deep.
7. Trim **ALL** carpet edges far enough to get into good material and maintain the structural integrity of the carpet. **Always** follow the manufacturer's instructions.
8. A heat shield **is required** for the iron.
9. **Heat** distorts synthetic carpet backing and can affect or discolor face yarn, such as wool.
10. Seams are **NOT** to be constructed directly on top of cushion, **always** on hard surface.
11. Use non-heat conducting surface behind seaming iron, preferably a wood weight.
12. Apply a seam sealer to thickness of both seamed edges when installing over cushion. Be careful not to allow the seam sealer to come in contact with the face yarns.
13. Star rollers are **NEVER** used when heat is involved in construction of a cut-pile carpet seam.
14. Move seaming iron in the direction of the carpet nap (pile) to avoid pile yarn distortion.

#### **POWERSTRETCHING – FOLLOW MANUFACTURER GUIDELINES**

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1. CFI states that **ALL** rooms are powerstretched, **regardless of size**. The CRI-105 states to stretch synthetic-backed tufted **1 to 1-1/2 %** in length and width unless manufacturer states otherwise.
2. The use of a powerstretcher is **MANDATORY**.
3. Stretching synthetic-backed tufted carpet **slightly less in width may lessen** seam peaking.

## ***Woven and specialty carpets require specific installation methods***

### **PATTERN MATCHING – FOLLOW MANUFACTURER GUIDELINES**

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1. **SET MATCH PATTERN** - figure matches straight across each side of the carpet width
2. **DROP MATCH PATTERN** - the figure matches in the middle of the design. **\*\*ALWAYS** check with manufacturer concerning pattern tolerances. The following are guidelines, but do not apply if the manufacturer stated tolerances do not agree. NO industry standards.
3. **BOW TOLERANCE** – pattern sags in center. Tolerance usually is 1-inch in 12-feet. Tolerances are stated by manufacturers and may vary. ALWAYS refer to manufacturer guidelines.
4. **SKEW** -portions of printed or tufted patterns that deviate from a straight line – out of “square”. Tolerance may be 2-inches in 12 ft. Check with manufacturer as there is no industry standard.
5. **PATTERN ELONGATION** – patterns vary in size, length or width from one match to the other match. Tolerance is generally 1-inch in 10-feet. Check with manufacturer.

### **TACKSTRIP – FOLLOW MANUFACTURER GUIDELINES**

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1. **Gully**, space between wall and tackstrip, slightly less than carpet thickness - not exceed **3/8”**
2. Standard tackstrip is **one-inch wide** and **1/4-inch thick**
3. Carpet is **NEVER** stapled to the tackstrip
4. Tackstrip is not installed across doorways
5. Tackstrip is to be installed on **each tread and each riser of the stair for a waterfall step.**
6. No tackstrip section is to be installed with **less than two nails**
7. Tackstrip is placed on **all sides** of the spindles on the steps
8. **Architectural tackstrip** with three rows of pins is used for carpet with heavy backing, woven and specified Berber carpets, for rooms exceeding 30 feet and commercial installations.

### **ADHESIVE APPLICATIONS- FOLLOW MANUFACTURER GUIDELINES**

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1. Installer must achieve full coverage of adhesive on carpet backing and floor, covering both **with equal transfer of adhesive, leaving no voids.**
2. **OPEN TIME** will vary according to temperature, humidity and adhesive
3. The **LIGHTEST** roller, **not to exceed 75 lbs.**, is used to achieve transfer for a direct-glue installation.
4. Most common size trowel used for Direct-Glue **-1/8" x 1/8" x 1/8" U-notch**. The type of carpet backing determines depth of notches. Always maintain notch size throughout entire installation.
5. **UNITARY or WOVEN CARPET** must be **rolled a second time**, approximately 3-4 hours later.

### **DOUBLE-GLUE APPLICATION – FOLLOW MANUFACTURER GUIDELINES**

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1. CFI recommends that **ALL** seams of double-glue installations **are to be sealed and hot-melt taped** UNLESS the manufacturer states otherwise or profiling becomes an issue.
2. Use roller **weighing 35-50 pounds** or stiff broom on tufted or woven double-glue installations.
3. Pressure-sensitive adhesive is recommended between floor and cushion. Recommended trowel size **-1/16"x 1/16"x1/16" square notch** - **Verify with manufacturer**
4. Use **1/8"x1/8"x 1/16" U-Notch** trowel to apply adhesive between **smooth-backed** carpet and cushion. **Always** follow manufacturer's instructions.
5. Use **1/8" x 3/16" x 1/8" U-notch trowel** to apply adhesive between rough backed carpet and cushion. **Always** verify with the manufacturer

## COMMERCIAL INFORMATION – FOLLOW MANUFACTURER GUIDELINES

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1. **CRI-104** --COMMERCIAL Installation Standard – Always follow the manufacturer's guidelines
2. Cushion thickness is **3/8 -inch** for commercial installation--no density stated.
3. **Review CFI Residential Guidelines. Many also apply to Commercial installation.**

## EPA INFORMATION

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1. **EPA** - Environmental Protection Agency
2. **EPA** – an Office of Federal Government
3. **IAQ** - Indoor Air Quality - **GREEN** label is attached to carpet backing on display in showroom
4. **VOC** -Volatile Organic Compound -relates to low or no VOC's in adhesive products
5. **4-PC** - phenocyclohexene – new ODOR FROM CARPET has never proved to be life threatening. Sensitive persons should consider leaving the area during the installation.
6. **VACUUMING** should be performed by the Customer prior to the removal of the carpet
7. **VENTILATE** during installation by using fans, windows, doors or HVAC systems.
8. **CONTINUE VENTILATION** at normal room temperature for 72 hours following installation

## OSHA INFORMATION

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1. **OSHA** - Occupational Safety Health Administration or Act
2. **OSHA** - Office of the Federal Government
3. **OSHA #2203 (yellow)** "Employee's Right to Know" - Employees must be trained to install ALL products handled. Note: New poster #3165 (white-blue) replaces this (It is #2203-Yellow on test)
4. **HAZCOM** -Hazardous Communications Plan
  - (a) Keep Safety the #1 Priority
  - (b) Plan lists training procedures for company employees
  - (c) States location of MSDS Sheets
  - (d) Identifies all products company uses and chemical inventory
5. **FINES**
  - (a) Maximum first time fine is \$7,000.00
  - (b) Maximum-next offense is \$70,000.00
6. **FINES** issued for items such as:

(a) No HazCom Plan	e) Defective tools
(b) No Kneepads	f) Improperly labeled or unmarked containers
(c) No First-Aid Kit	g) Ground wire removed from electrical cords
(d) No Ventilation	h) No MSDS sheets (Material Safety Data Sheets)
7. **MSDS-MATERIAL SAFETY DATA SHEET lists:** (Request MSDS at time of purchase)
  - a) Manufacturer and product
  - b) Physical data (volatile, boiling point, etc.)
  - c) Fire and explosion hazard data -how to extinguish fire, etc.
  - d) Hazardous Ingredients
8. **CHEMICALS** can only be transferred by ONE person to another properly labeled container.
9. **HEALTH HAZARD DATA listed on MSDS** (exposure limits, first aid) includes the following.
  - (a) Reactive data (stability - what not to mix with product)
  - (b) Special handling precautions
  - (c) Special protective equipment and procedures - gloves/ventilation
  - (d) Spill and leak procedures
10. **CARPET** or **CUSHION** does not require an MSDS Sheet – considered finished products
11. **ASBESTOS** should always be covered or encapsulated -Testing is only way to properly identify
12. **FIRST AID KIT**- Contents of kit must be undisturbed with a letter signed by a physician



## VOCABULARY

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1. **ACID** – Displays a pH below 7 – Neutral is 7
2. **ALKALINITY** – A base or salt. Property of water substances with a pH greater than 7
3. **AMBIENT AIR** – Air around us
4. **BIAS** – Diagonal in relation to pattern alignment
5. **BCF** -Bulked continuous filament -continuous strands of nylon fiber
6. **BREADTH** – Width of broadloom
  
7. **BOND TEST** – 24-hour test to determine if flooring will stay adhered with adhesive to substrate
8. **BOW** – Describes pattern that sags in the center
9. **CALCIUM CHLORIDE TEST** – 24 hr. test for concrete moisture emissions
10. **CONDENSATION** - The conversion of the moisture in the air to water
11. **DEADMAN** – Board with tackstrip installed on one side facing same direction. This is used to stretch off of the wall or to match patterns in the carpet. Deadman is used as a portable wall.
  
12. **DEW POINT** – Temperature at which vapor begins to condense and form water
13. **DRY LINE** – Line used to aid in determining patterns (such as, a chalk line with no chalk)
14. **FRIEZE** -Tightly, twisted yarn that displays a nubby, rough appearance
15. **GAUGE**- Number of ends of surface yarn counting across the width
16. **HEAT SETTING** -Stabilizing process of carpet yarns by exposure to heat
17. **JUTE** - A natural cellulose fiber derived from plants of the East used for backing material
18. **LITMUS PAPER** – A material used to measure alkalinity of concrete or water
19. **MAT TEST** – Method used to check for water or moisture through substrate by taping section of plastic to floor with duct tape
  
20. **PATTERN ELONGATION** – Patterns vary in size, in length or width from one match to other.
21. **pH** – Acceptable range of concrete is between 5-9 pH. Indicates relative acidity or alkalinity of the concrete
22. **POLYPROPYLENE** -Synthetic thermoplastic polymer used in carpet and backing
23. **PORTLAND BASED** – Gray floor patch, cement based, containing latex that is chemically dry
24. **POROSITY** – Ratio of volume of air within the boundaries of a solid matter and term used to describe the substrate’s ability to absorb liquid
  
25. **rH** – relative humidity – moisture in vapor form in the air
26. **RMA Test** – Method used to assess moisture emissions through concrete. (Rubber Manufacturers Association Test)
27. **ROLL SEQUENCE** – Numbered order of carpet rolls used to keep dye lot sequence
28. **SBR** -Styrene butadiene synthetic rubber found in most carpet backings
29. **SEAM SEALER** - Formulated adhesive for securing cut edges of carpet to be seamed or finished
30. **SELVAGE** -The factory edge of the carpet
31. **SKEW** – One pattern does not lay at 90-degree angle to pattern at opposite width – out of square – one pattern runs ahead of another pattern
  
32. **SLAB TEMPERATURE** – Concrete substrate temperature no less than 65-degrees
33. **5 lbs.** – Amount of moisture allowed to emit from concrete substrate per 1000 square feet
34. **3-4-5 RULE** – Easy method used to square area or carpet
35. **TUFT BIND** - Amount of force required to pull a tuft from the carpet
36. **UNITARY CARPET** - Carpet backcoated with high-quality latex to increase the tuft bind. Install **direct-glue method ONLY** if you do not have **WRITTEN** manufacturer’s instructions!
37. **VAPOR EMISSION** – Water emission from the substrate in vapor form

## Section 6 - THE KOOLGLIDE SEAMING SYSTEM CERTIFICATION

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### Welcome and Congratulations!

The installers will witness what SEAM MASTER SOLUTIONS and thousands of installation professionals and technical people throughout the industry know is a “**revolutionary**” new way to seam carpet! After being burned by hot thermoplastic and breathing the smoke and fumes from a hot iron, the KOOLGLIDE SEAMING SYSTEM is exciting.

The **KOOLGLIDE CERTIFIED INSTALLER** has access to the KOOLGLIDE Installation Technical Hot Line at **(800) 861.SEAM (7326)**.

The **KOOLGLIDE “PRO”** Model with 3 settings - **L, M, H**

**L** – Setting is mainly used for seaming carpet over cushion in a temperature controlled or warm environment.

**M** – This setting is used when seaming carpet in cold room conditions or over a seaming board.

**H** – Use when seaming carpet in a cold room, over wood or on bare concrete. DO NOT USE this setting directly over the cushion.

Failure to use the correct setting for the application may result in poor bonding or severe sticking of the tape to the carpet cushion or pad.

Always activate the system on a test sample of carpet **PRIOR** to starting the seam to ensure proper tool setting.

The KOOLGLIDE “PRO” Model will automatically reset to the “L” setting when unplugged.

During the KOOLGLIDE Certification session, installers are introduced to the many uses of the tool. During this session, we will share how the procedures to reconstruct a seam with minimal involvement if it doesn’t look exactly as you planned. No more removal of the furniture and the carpet to reconstruct seams. It’s just a manner of reheating the area and using professional techniques to achieve the best appearance.

To repair areas or to reconstruct seams, the work is done from the surface of the carpet. This saves time and allows the installers to provide their customers with the finest work available.

***Welcome to the new world of seaming!***

**THE KOOLGLIDE SYSTEM!**

## Section 7 - General Knowledge of Estimating and Measuring

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A number of installers prepare the estimate for the customer. **Preparation makes the difference!** This includes all parties. The importance of the seaming diagram contributes to the overall success of the installation. The diagram “paints a picture” of what is expected to happen. Every time a job is PROPERLY planned, it is finished to everyone’s expectations. It is not guesswork! “If it doesn’t start right, it absolutely will NOT finish right!” Proper planning pays big dividends!

Paint the installer a picture of what is to be expected.

Every time a job is PROPERLY planned, it is always finished to everyone’s expectations!

Don’t guess! **PLAN!**

**“If it doesn’t start right, it absolutely will NOT finish right!”**

**PROPER PLANNING pays dividends!**

***Following these guidelines leads to a successful carpet installation.....***

To achieve Customer Satisfaction, a detailed diagram is a **MUST**, as well as:

- Correct address, telephone number and directions and contact name if questions arise
- Discuss items with the customer that lead to a professional installation – PREPARE the customer!
- Indicate seam location and prepare a cut list
- Allow **THREE** inches to **EACH** length cut
- If pattern is involved, add **one full pattern to length and add to the next pattern on width**
- No more than **three** seams per average room, not including doorway seams
- Indicate type of carpet and carpet backing
- Indicate pattern match and direction to install, if required
- Indicate type of installation
- Indicate substrate type and if necessary, floor preparation materials and requirements to correct
- Indicate door terminations and requirements to adjoin to other flooring surfaces
- Designate party responsible for furniture. If installer moves, list equipment required to move items
- Designate party responsible for removal of carpet and cushion
- Designate party responsible for the disposal of materials
- Indicate oversized items to be moved and equipment required to do so – remembering that no item should be moved that could create injury for the Installer – Customer should be charged for time involved in dismantling and reassembling furniture and specific items – obtain fair prices from a furniture moving company
- If required, note the water, gas, stove, etc. shutoffs
- Check that the areas will be clean, heated and well-ventilated
- Specify the proper cushion – don’t prepare for a restretch!
- Estimate sufficient carpet to do the job properly! No patchwork! Closets are measured!
- List installer’s access to area based on the size of cuts – note floor or area in building
- Guidelines are designed primarily for residential use. Commercial estimating requires additional skills.

The parties responsible for estimating AND selling the job must involve the customer in the location of the seams and furnish an explanation as to how the seams will appear in the area. **SEAMS ARE NOT INVISIBLE!** They are **NOT** poured from a bottle! Our job is to satisfy the customer!

When measuring or selling the job, explain that some carpets do seam better than others and avoid a potential problem. At the time of the sale, if the seam appears to be a major concern, suggest carpet styles that seam more to the customer’s expectations!

**PILE DIRECTION** is a preference, but it should generally follow the traffic flow.

**ALWAYS CONSIDER THE FLOW OF TRAFFIC and the EFFECT OF LIGHTING ON SEAMS**

The Installer will follow Industry Standards when constructing a seam, but due to lighting, the color and texture of the carpet, the seams may not be invisible. It is too late to discuss the effect of lighting and the traffic patterns once the seaming procedure begins! The customer must be prepared that **SEAMS DO SHOW!**

## SEAMS ARE TO BE POSITIONED SO THAT...

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1. Main traffic runs along, rather than across the seam
2. Light does not strike across the seam (whenever possible)
3. Seams are not constructed perpendicular to doorway openings
4. Seams are constructed away from the major traffic flow
5. Seams are positioned away from the areas subject to pivotal traffic
6. Crossgrain seams are kept to a MINIMUM

**CAUTION:** To provide the customer with the finest installation, crossgrain seams should not be sold in sisal or like products, flat-weaves, higher-denier yarns or in any carpet in which a seam cannot be constructed to achieve customer satisfaction. Crossgrain seams create problems. Prepare at the time of the measurement to avoid difficult situations.

Sufficient carpet must be ordered for all types of carpet, but especially when patterns are involved. There are carpets in which seams cannot be constructed to meet the customer's satisfaction. Always measure for the sufficient amount of carpet to provide the customers with an installation of which they can be proud for many years.

## PLANNING WITH THE CUSTOMER

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### FLOOR PREPARATION

Loose, noisy and squeaky floors should be repaired PRIOR to the arrival of the installer with the use of screw-type nails. Also, any loose tile or vinyl should be secured prior to the installation. Installers do not remove existing vinyl or tile flooring due to possible health concerns and OSHA requirements. Unforeseen subfloor problems under carpet that is removed by the installers may require additional labor and material costs. The installer, using a compatible latex-patching compound at an additional cost will fill cracks and depressions of 1/4-inch or less. Deficits of more than this size are the responsibility of the owner or general contractor.

### CONCRETE SUBSTRATE

Due to existing slab conditions, such as cracks and uneven surfaces, it is suggested that **one hour of floor preparation be included for every 100-square feet of covered floor.** This should allow ample estimated time to cover unforeseen floor prep charges undetectable because of existing floor coverings, such as carpet and cushion. Acceptable moisture and alkalinity readings are important to the success of the installation.

### EXISTING VINYL FLOOR COVERING

Due to possible health concerns and OSHA requirements, installers do not remove vinyl or vinyl tile flooring. On wood subfloors, specify new plywood underlayment or liquid embossing product. Be certain to check for adequate clearance at the dishwasher and refrigerator at floor level and at the cabinet enclosure.

### CARPET REMOVAL

Existing tackstrip can be used. It is NOT to be removed. This creates unnecessary holes in the floor and on concrete floors; a possibility of cracking and breaking the concrete exists. If it is not reusable, the installers will replace it at an additional cost. Carpet is never to be stapled to the tackstrip. If the tackstrip has been installed too far from the wall creating a space that will serve as a "dust catcher," additional labor charges are to be expected if it is to be removed and new tackstrip installed for the correct finished appearance. If the customer is removing carpet and cushion, the floor must be completely clean. No staples can remain. If carpet has been glued directly to floor, the surface must be clear. Any projections that remain will telegraph through face pile.

### FURNITURE REMOVAL

If the installers are removing the furniture, all items should be removed, such as dishes from the hutch, wall plaques, books from cases, pictures and breakable items. Remove drawers from furniture. Bed coverings should also be removed. Items under the bed and on the floor of the closet should be removed. All breakable and small items are to be removed **prior to the arrival of the installers.**

### FOLLOWING THE MANUFACTURER'S INSTALLATION GUIDELINES

It is important to remember that any installation requiring deviation from the manufacturer's recommended specifications VOIDS the installation warranty.

## **MOLDINGS / QUARTERROUND**

Expect painted woodwork and/or quarterround to be scratched. Prepare the customer to do minimal touchup work even though the installers will take extra precaution to avoid scratching, breaking or splintering. All painting must be completed **48-hours prior to the arrival of the Installers.**

## **NEW HOMES/ NEW BUSINESS FACILITIES**

Areas must be heated twenty-four hours prior to the installation AND the substrate must be heated to a minimum of sixty-five degrees prior to and following the installation of the carpet. This cannot be achieved by turning up the thermostat shortly before the Installers arrive. The minimum temperature for a completed installation can never fall below 50 degrees at any time.

## **FRESH AIR VENTILATION**

Fresh air ventilation should be used during the installation and should continue for a period of 48-72 hours following. This procedure will help to exhaust and eliminate any lingering odors.

## **PROTECTION OF AN INDOOR INSTALLATION**

Plastic sheeting is NEVER placed over direct-glue, double glue or stretch-in installations as it may trap moisture and retard the curing of the adhesive and promotes mold and mildew. The use of plastic sheeting voids the installation warranty. Protect the new installation from rolling traffic by using sheets of hardboard or plywood in the designated areas.

## **DISCONNECTION of APPLIANCES**

Installers disconnect appliances, but do not always reconnect them. In order to install kitchen, laundry room or bath flooring; the refrigerator, washer, dryer, dishwasher, compactor, icemaker, refrigerator, and gas lines to the stove must be disconnected

## **CUTTING OFF DOORS**

Remember, if purchasing a carpet or cushion of a height not presently installed in the home or office, doors may require cutting. Not all installers are qualified to do this service.

## **LOWER PILE HEIGHT THAN CARPET ORIGINALLY INSTALLED**

If the pile height is less than what is presently installed and the walls are painted or papered, a possibility exists that a line will be visible above the trim that will be unsightly.

## **THE “IF’S” THAT SATISFY OUR CUSTOMERS.....**

IF the carpet, cushion and installation are sold correctly,

IF the customer has been properly prepared,

IF the estimator has “painted the true picture” for the installation,

IF the installer follows the detailed diagram,

## **ANOTHER HAPPY CUSTOMER RETURNS TO PURCHASE FLOORING AGAIN!**

### **Communicating with the Customer**

Knowing what the customer expects from their flooring investment helps the installers to provide better service. Associates who develop a real partnership with the installation professionals find they encounter fewer problems in the field. A detailed diagram outlining the customer’s expectations avoids potential problems.

## Section 8 Seam Placement - Seam Preparation – Seaming Techniques

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**SEAM CONSTRUCTION** - The installer has a choice of seaming tools:

### 1. The traditional method using the seaming iron with the correct seaming tape

- Improper selection of seaming tape leads to problems
- The traditional seaming iron temperature setting is not the same for all irons, seaming tapes, carpets or carpet backings.

### 2. The new seaming technology – KOOLGLIDE Seaming System

- Radio-wave technology
- No odor – no fumes – environmental friendly – customers appreciate the use of this tool
- Opportunity to remake existing seams without tearing up the customer's home

### **ALWAYS SEAM ON A HARD SURFACE!**

- Construct all seams on a hard surface, never on top of the cushion
- Use the proper roller - NEVER use a “starred or tractor” roller with hot-melt tape when constructing a seam in cut-pile carpet installed over cushion
- Use a non-heat conducting weight behind the seaming iron

### **PLACEMENT OF SEAMS**

- Whenever possible, seams are positioned away from the traffic areas.
- Main traffic runs parallel or along the seam rather than across the seam.
- Whenever possible, natural light should not strike across seam.
- Seams should be kept away from areas that receive pivotal traffic.
- Whenever possible, do NOT construct seams perpendicular to the doorway openings.
- Keep crossgrain seams to a MINIMUM! A maximum of 2 crossgrain seams is acceptable per fill section.
- Inform the customer of the seam location.

### **SEAMING TECHNIQUES – ALWAYS FOLLOW MANUFACTURER GUIDELINES**

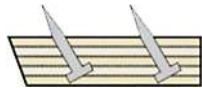
- Seams are a reflection of you and your skill. Use proper techniques to achieve customer satisfaction.
- Seal ALL seams with appropriate sealer UNLESS manufacturer's directions state otherwise,
- Correct iron temperature is essential depending on type of seaming tape, iron and carpet.
- Carpet construction and type of backing will determine type of seaming tape to be used.
- Most carpets are cut from the face, not from the back.
- When carpet is cut from the back, low rows of yarn may appear if knife blade cuts too deep.
- Trim ALL carpet edges far enough to get into good material and maintain the structural integrity of the carpet. Always follow the manufacturer's instructions.
- A heat shield is required for the iron.
- Heat distorts synthetic carpet backing and can affect or discolor face yarn, such as wool.
- Seams are NOT to be constructed on top of cushion, always on hard surface.
- Use non-heat conducting surface behind seaming iron, preferably a wood weight.
- Apply a seam sealer to the thickness of both seamed edges when installing over the cushion. Be careful not to allow the seam sealer to come in contact with the face yarns.
- Star rollers are NEVER used when heat is involved in the construction of a cut-pile carpet seam.
- Move seaming iron in the direction of the carpet nap (pile) to avoid pile yarn distortion.

## Section 9 Tackstrip

### IMPORTANCE OF TACKSTRIP

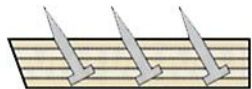
TRAXX, a manufacturer of tackstrip provides the following information describing the product that was developed in the 1930s. There are several important factors to consider when selecting carpet strip for a particular type of installation, including: the width of strip, the type of anchoring nail used, the length of strip, the type of wood, the pin height, and whether or not to use aluminum strip. The placement of the tackstrip is very important to the success of the installation.

### WIDTH OF STRIP



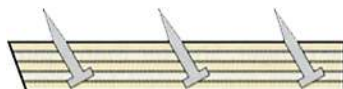
#### **One-INCH wide tackstrip**

The most widely used type of strip. Plywood is one full inch wide. Front and back rows of pins are moved farther apart for extra strength and easier hooking with stiff carpets or thick cushion. Use during residential and commercial installations when extra holding power is desired. Meets the requirements of CRI-104 and CRI-105 for residential carpet installation.



#### **Tri-Tack – Commercial 1 1/4" wide tackstrip**

Introduced in the mid-1990s, Tri-Tack is now the fastest growing type of strip sold. Offers a full 3 rows of pins set in a 1 -1/4 inch wide plywood strip. An economical alternative to double stripping and full width commercial carpet strip. Provides extra insurance on difficult residential installations. Excellent for use on Berbers. Meets the requirements of CRI-104 and CRI-105 for residential and commercial carpet installation.

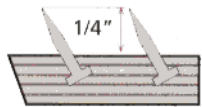


#### **Commercial – Architectural 1 3/4-inch wide tackstrip**

The traditional product is used on difficult installations of any kind. Three rows of pins are spaced equally over a 1-3/4 inch wide strip. Anchoring nails are positioned closer to the wall to prevent strip from lifting during heavy stretching. Use on large installations when maximum holding power is required. Meets the requirements of CRI-104 and CRI-105 for residential and commercial carpet installations.

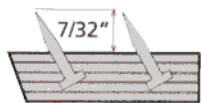
### PIN HEIGHT

All types of carpet strip are available in several different pin heights in order to accommodate even the most exacting carpet installation requirements.



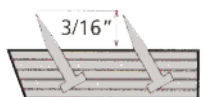
#### **C Pin**

1/4-inch pin height used for carpets with rough or thick backings where extra penetration is required.



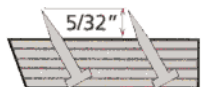
#### **E Pin**

7/32-inch pin height used for most carpet installations.



#### **D Pin**

3/16 inch pin height used for carpets with short, dense pile to avoid pins showing through the carpet face.



#### **J Pin**

5/32-inch pin height used with very thin carpet, fine velours and velvets with thin backings.

## Section 10 PATTERNED CARPET

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### THE CUSTOMER'S EXPECTATIONS

We must understand the complexity of working with patterned carpets. Too often there exists a huge gap between reality and customer's expectations. The customer is promised something and then reality sets in because the installer cannot achieve what was promised. Patterns not designed for crooked walls, curved staircases or angled hallways are never acceptable. Generally, it cannot be accomplished!

Even if the material is within manufacturing tolerances, **ALL** parties need to be aware that "standard" installation methods will not always bring patterns to an acceptable level for the customer. The salesperson **MUST** discuss characteristics with the customer and **ONLY** "promise" what can be realistically accomplished. ***"If it does not start right, it will not finish right!"***

### MANUFACTURER'S RECOMMENDATIONS

Always follow the manufacturer's recommendations in all areas of the installation, as well as guidelines concerning ventilation that are to be addressed **prior** to the installation. Regarding the installation of all flooring materials, the individual carpet manufacturers reserve the right to provide specific installation instructions, which are the installer's primary source of direction.

### PATTERN TOLERANCES

Follow the manufacturer's guidelines. If information is not available, the following guidelines are helpful:

**Do NOT cut or install** carpet IF a defect is visible OR if:

- Skew / Bias is greater than **1-1/2 inches in 12-foot width**
- Bow is greater than **1-inch in 12-foot width**
- Trueness of Edge is greater than **1/2-inch in 12-foot length**
- Pattern Elongation in length is more than **1" in 10-feet**

### POWERSTRETCHER and DEADMAN

- The use of a powerstretcher and deadman are **mandatory** for installation of patterns in all types of applications. If a direct-glue installation is involved, stay nails may be necessary also.



## BASIC PATTERN MATCH TYPES

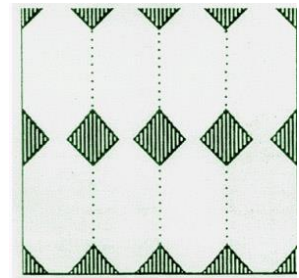
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Basic design repeats itself throughout length and width.

Pattern match designates the arrangement and dimensions of repeating units that create design of patterned carpet.

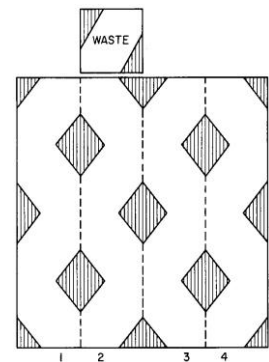
### SET MATCH

Set match refers to a pattern in a carpet that continues straight across the breadth at a right angle to the selvage edge. When connecting lines to each pattern repeat, squares or rectangles become *visible*.



### DROP MATCH

Every other repeat is dropped down one-half the repeated design length. Generally, this produces a larger scale effect often enhancing a diagonal pattern alignment across the width.



### NOTE

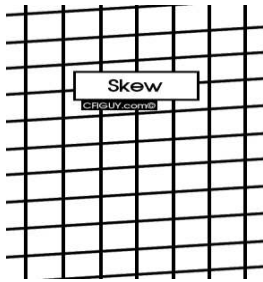
SET MATCH or DROP MATCH can produce a diagonal effect.

However, the visual presence of a diagonal is not an accurate method of determining whether a pattern is a SET or DROP MATCH.

# PATTERNED CARPET TOLERANCES

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## 1. Skew

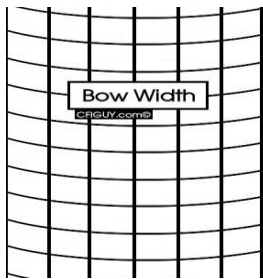


**SKEW or BIAS** – Distortion is noticeable when the pattern on one side is slightly ahead of pattern on opposite side.

**Recommended tolerance is no more than  
1-1/2 inches in 12-foot**

If the skew is no more than 1-1/2 inches in 12-feet, a qualified installation contractor who is paid according to the work and time involved should be able to correct the problem.

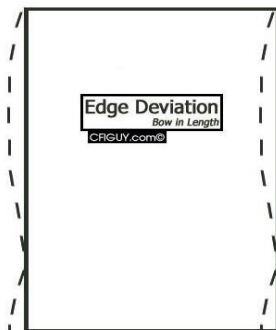
## 2. Bow Width



When viewed across the width, the distortion is visible as wavy or crooked lines that occur in the width of either patterned or plain carpet, usually occurs when carpet is not perfectly straight as it is being manufactured.

**Recommended tolerance is no more than  
1-inch in 12-foot**

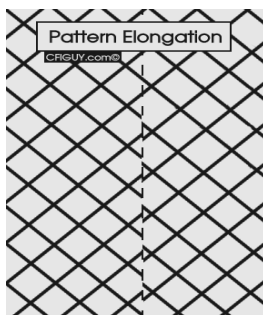
## 3. Edge Deviation - Trueness of Edge - Bow in Length



Pattern does not appear in length as a straight line. This can be measured between common pattern points along the carpet edge at or very close to the edge to be trimmed for seaming.

**Recommended tolerance is no more than  
1/2-inch in 12 feet**

## 4. Pattern Elongation – Pattern Run-Off



Variation of patterns from one breadth of carpet to the next. This condition accounts for the pattern growing along a seam.

**Recommended tolerance is no more than  
1-inch in 10 feet**

# PATTERNED CARPET INSTALLATION

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*CFI Proven Methods of Carpet Installation*

## 1. PREPARATION

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*Items that must be considered for the installation of patterned carpets*

1. Visual Defects
2. Manufacturer's Installation Recommendations
3. "Real World" Acclimation that allows for ease of installation
  - Variables that DO NOT allow for acclimation include:
    - *Other trades in the installation area*
    - *No designated areas for cutting the carpet*
    - *Potential for theft if materials are left on premises*
    - *Time constraints that do not allow the carpet to be dry laid*
    - *Other circumstances pertinent to the site*

NOTE: These should be **documented** for future reference in the event that an installation-related problem should arise concerning any of these issues.

4. Detailed Diagram
5. Squaring up Carpet and Area
6. Carpet Type: Printed or Tufted Patterns
7. Carpet Backing
8. Pattern Types
9. Pattern Tolerances
10. Pattern Repeat
11. Pattern Count
12. Installation methods
13. Cutting and seaming requirements
14. The correct installation tools
15. Ability to correct pattern distortion

## 2. Figure Pattern Repeat

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- Refer to manufacturer's listed pattern repeat prior both in width and length, prior to installation.
- To determine the actual pattern repeat of product being installed. Use a steel tape-measuring device, not a cloth tape.
- For patterns with decimal values, a simplified conversion table is illustrated.  
*Example: A carpet with a pattern repeat of 18.3750" equals 18-3/8"*

## 3. Figure accurate pattern count

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- A. Check manufacturer's stated pattern size
- B. Measure width of carpet from selvage to selvage and record the distance in inches.
- C. Check actual pattern for ample carpet to trim for a match
- D. Divide stated pattern repeat size into the inches recorded
- E. If the total of inches is more than the exact number of the pattern count, this allows for trimming of the selvage. The pattern count is correct

*Correct example:*

- Breadth of carpet, 12-feet wide = 144-inches
- Pattern repeat = 18-inches
- $144 \div 18 = 8$  repeats across 12-feet width

If after dividing and checking the count, there are not enough inches to trim, it is necessary to cut in one full pattern. The overall width of the carpet is now diminished by one full pattern. This could create a shortage of carpet to complete the installation. Contact the manufacturer.

*Incorrect example:*

- Breadth of carpet, 12 feet wide = 142-inches
- Pattern repeat = 18-inches
- $142 \div 18 = 7$  patterns plus 16-inches

Carpet repeat is 7 patterns plus 16" of waste which equals working material of approximately 10-feet 6-inches.

**Understanding tolerances, pattern repeats and  
the pattern count are critical to the success of the job!**

#### **4. Seam Preparation for Printed Patterns**

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The printed pattern on the face fibers does not necessarily follow a tufting row. The pattern may not align with the tufted row.

- Separate face fibers and examine full length of the fiber.
- An indication of a printed pattern is fibers that appear white or display no color on the lower 2/3's of the fiber.

#### **Methods of seam preparation to follow for printed patterns**

##### **A. Cutting from the back**

This method is used when face fibers are susceptible to shearing from top-cutting the face pile.

*Follow this procedure:*

1. Locate a designated pattern and mark the same spot on each repeating pattern.
2. Mark by carefully separating the face fibers.
3. Place a cut or slit through the secondary backing
4. Fold carpet back to expose the secondary backing
5. Align the straightedge with the carpet cuts
6. To avoid shearing face yarns, do not cut deep into the face pile.
7. Repeat this method on the adjacent breadth and cut the seam at the match point.

##### **B. Cut from top or face side of carpet**

1. This method works well with carpets that have very short, dense face fibers to minimize any shearing from the cushion-back cutter.

2. Use a straight edge and cushion-back cutter.
3. Place straightedge from a pattern repeat to the next pattern repeat; be aware of a length bow.
4. Follow the straightedge with the cushion-back cutter.
5. Repeat the same procedures on adjacent breadth.
6. Cut the seam at the match point.

**C. Run a row and trace cut**

*Important:* When using this method, the cut pile in looped carpet is reduced by one-half.

1. Run a row on one section of carpet.
2. Overlap this section onto the next section and match the pattern.
3. If necessary, stretch and stay-nail carpet prior to cutting.
4. Use a cushion-back cutter to trace cut the seam.

## **6. PATTERNED CARPET INSTALLED ON THE STAIRS**

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1. Type of stair installation – waterfall / cap and band
2. Finishing of stair edges – wrapped/upholstered edges, rolled and tacked, binding/serging
3. Placement of pattern on stairs in conjunction with stair spacing – pattern on floor
4. Each pattern does not appear at the same location on each stair unless ample material is ordered
5. Runner stairs – pattern will not match if carpet is turned
6. Carpet “smiling” on staircase
7. Sell carpet that will wear on the staircase
8. Sell cushion that will perform on the staircase

### **CFI Patterned Carpet Resource Guide**

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The CFI Patterned Resource Guide is a 60-page hardcover manual filled with up-to-date information concerning patterns, installation techniques, problem solving, pattern identification and just about everything one needs to know when working with patterned carpet.

## **Section 11 - POWERSTRETCHING – A Procedure that Protects the Installer!**

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Powerstretching is not a choice; **it is mandatory**, regardless of the size of the room. Use the kneekicker as a positioning tool **ONLY**. **Never use a spike!** This is not acceptable and voids the manufacturers' warranty. The kneekicker is **NOT** a powerstretcher.

Properly stretched carpet is not loose and displays no wrinkles or holes from malfunctioning tools. The recommended stretch from the CRI for tufted carpet is 1 to 1-1/2% in both length and width. You should always understand the carpet and know how it should be stretched. A thorough knowledge of the backing and carpet with which you are working can avoid overstretching that may result in seam peaking.

**It is never acceptable to secure the carpet to the tackstrip with staples.** This is a shortcut taken by those who are **NOT** professional flooring installers.

### **Tools required for power stretching carpet**

#### **Power stretcher**

Carpet installation tool used to stretch carpet onto tackstrip and to match patterns. All carpet must be powerstretched. For woven carpets, during stretching the dimensional stability is much greater than tufted carpet. The use of a cottonhead is recommended if the carpet is woven or of loop-pile construction

#### **Pattern Stretcher - Restretcher**

This tool does **NOT** replace the powerstretcher. It is a double-headed tool with multiple uses, much smaller and lighter than the powerstretcher. It is designed to assist with aligning patterns and restretching carpets.

#### **Deadman**

This tool is designed to use with the powerstretcher to achieve pattern alignment and to protect the walls and base. It can also be used as a wall when stretching from windows and painted wall base.

### **Powerstretching Procedure for Tufted – Non-Patterned Carpets– Action-Bac**

- Use a 2-way stretch. Attempt to stretch 1 to 1-1/2% in length and width at a 15-degree angle.
- Select a corner and set that corner.
- Stretch from the set corner and securely hook it on the tackstrip.
- Set this wall, stretch and securely hook at a 90-degree angle.
- Go back to set corner, working down the wall opposite to first stretching wall. Continue the procedure.

### **Use a Wall Trimmer to Finish the Powerstretching Procedure**

Use a wall trimmer next to the wall to avoid damage to the wood. This procedure is also used to properly trim and tuck the carpet into the gully and seal the carpet onto the tackstrip. It is the installer's responsibility to protect the base and wood.

### **Restretching**

If restretching should become necessary, the rooms are to be emptied of all furniture to achieve the proper stretch. Start the stretching procedure by placing the deadman in the center of the room. Stretch one-half of the area, reposition the deadman and stretch in the opposite direction.

### **Importance of using the powerstretcher and all tools properly**

The use of professional installation techniques protects you and ensures you of a healthy career. The National Institute of Occupational Safety and Health (NIOSH) in publication 90-104 ([www.cdc.gov](http://www.cdc.gov)) states: "WARNING: Serious knee injuries frequently result when carpet installers use a kneekicker to install carpet. They should use a powerstretcher, a safe alternative to the kneekicker."

## Section 12 – Direct-Glue Installation Preparation and Procedures

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### INSTALLATION SPECIFICS

#### A. Acclimation

1. Minimal acclimation is better than none at all for the ease of installation
2. Room temperature - slab at 65 degrees F
3. Substrate is to be heated 24-hours prior to the installation

#### B. Alkalinity and Moisture

1. May appear as a white residue on the concrete surface
2. High alkalinity can create an adhesive failure – tests should always be conducted

#### C. Preparation of the Substrate

1. Bubbles may be the result of a broken water pipe or solvents used or if the adhesive was applied over “spills” by other trades
2. Floors installed with existing latex adhesive are generally acceptable for a glue-direct installation
3. If asbestos tile was previously installed, a residue of the old “cut-back” adhesive may be visible. It may contain asbestos and must be encapsulated (covered) or removed by a licensed abatement contractor. Asbestos is dangerous and OSHA requirements must be followed.
4. If unsure of the adhesive qualities, the presence of asbestos or compatibility issues with existing adhesive, contact someone for assistance.
5. Concrete floors can be classified as below grade, on grade or above grade/suspended
6. Select the correct adhesive
7. Use the proper notched trowel and maintain the notch throughout the installation
8. Achieve proper transfer of adhesive into carpet backing and onto the substrate as completely covered
9. Open time is critical!
10. Rolling procedures

#### D. DIRECT-GLUE SEAM PREPARATION

1. Run a row
2. Cut the carpet
3. Use a seam weight
4. Use 6-inch roller – starred or smooth, depending on the type of carpet and if heat is involved
5. Seal the edges with the appropriate seam sealer
6. Construct the seam
7. If necessary, use stay nails, powerstretcher and deadman

#### E. DIRECT-GLUE INSTALLATION PROCEDURES

1. Select the correct notched trowel and maintain the notches throughout the installation
2. Application of adhesive with trowel or spray system
3. Laying in wet
4. Open time
5. Breadth of carpet
6. Staffing the job
7. Rolling the installation

#### F. PROBLEMS and REASONS THEY OCCUR

1. Lack of adhesive
2. Incorrect notched trowel
3. Trowel notch not maintained
4. Open time
5. Seam sealer on carpet
6. Repair techniques – no slicing of carpet - demonstration

**NOTE: Apply caulking under metal or vinyl reducer trims during installation**

## **Direct-glue installation techniques for patterned carpet installation**

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1. Identify backing and secure any installation products that are required by manufacturer
2. Determine the pattern count
3. Arrange cuts to install the longest patterns first
4. Dry-lay areas prior to applying adhesive or hot-melt seaming tape
5. Prestretch the carpet prior to seaming ONLY if it is necessary to match the pattern.
6. For smaller areas of adhesive installation, fold the carpet back approximately 3-feet on each side of the seam. Size of the fold is determined by the amount of pattern distortion. In larger areas or with carpets displaying excessive pattern elongation or runoff, other adhesive applications must be used.
7. Apply adhesive using a trowel or the spray system application
8. If necessary, lay carpet into wet adhesive to slide carpet for matching the pattern.
9. Use the correct seam sealer.
10. Begin in center of seam and work away from it to align the patterns.
11. Use a two-headed powerstretcher or deadman to stretch shorter patterns to match the longer patterns
12. Stay nails are to be used on wood or concrete substrates to hold pattern on line
13. Use a kneekicker to push the fullness toward the center of the carpet
14. Do not remove stay nails until adhesive has reached bonding strength

### **SEAM CONSTRUCTION**

#### **A. Hot-melt seams if pattern matching is minimal**

1. It is recommended that all seams be constructed on a hard surface.
2. Seams are generally constructed in the same direction as the nap lay.
3. Start in center of carpet to align the seam in patterned goods.
4. Stay-nail seam as the pattern is aligned.
5. Place the deadman on the short patterns of the seam where the seam is matched.
6. Using the powerstretcher, stretch short side to match long side and stay nail in place.
7. Continue this procedure along the entire length of the seam.
8. Repeat procedure in the opposite direction until pattern is aligned.
9. Construct the seam running the same direction as the entire length of the nap.
10. Seal seams according to manufacturer's instructions.

#### **B. Constructing hot-melt seams if pattern distortion is greater**

1. Position the seaming iron to move in the same direction as the nap of the carpet.
2. Construct seam while matching the pattern and complete one-half of the seam.
3. Repeat construction of the other half of seam.
4. Position seaming iron in opposite direction of the nap lay.
5. Do NOT slide the non-heat conducting weight against the grain of the carpet. Lift and place it to avoid distortion of the yarns.
6. Seal seams in accordance with the manufacturer's installation guidelines.



## Section 13: CARPET WITH ATTACHED CUSHION

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*It would be difficult to name each ATTACHED-CUSHION product and show a photograph of each because most carpet manufacturer's private label the backing. In other words, you may see the same cushion attached to three different manufacturer's products, not using the same name even though it is the same ATTACHED CUSHION.*

In keeping up with the carpet industry, the backing is almost as important as the face of the carpet. Every time you turn around someone is coming out with a new "backing system." The manufacturers, who haven't yet, will probably be doing so soon. The reason for this is simple. Today, the consumer is looking for something different and an added value for their purchase. They want the comfort of a cushion. They like the idea that a carpet backing is available that will not scratch their walls and furniture. Their eyes light up when you tell them that they no longer need to worry about restretching this product. Today, office buildings are receiving the comfort of cushion in a direct-glue installation. The customer no longer must be concerned with restretching. This is a big plus when you consider the office systems that have to be dismantled to properly restretch carpet.

We are seeing many different ATTACHED CUSHION products on the market, so don't fall into that "ATTACHED CUSHION IS ATTACHED CUSHION" trap, just like "CARPET IS CARPET." Most of the ATTACHED CUSHION products are made of urethane and extenders or fillers. The extenders are used to control the density.

Another big factor is the "pre-coat" used to apply the ATTACHED CUSHION onto the carpet. The carpet manufacturer decides what pre-coat will best fit their requirements for a specific product. Then the carpet is normally sent to an outside source for the backing application. The pre-coat systems of are:

- 1) Latex pre-coat
- 2) Urethane pre-coat
- 3) EVA pre-coat (ethylene vinyl acetate)

The EVA pre-coat has a lot to do with the pliability of the carpet. Some of the different urethane products available are prime urethane, some condensed urethane products, some with felt scrims on the back of the cushion and some with high-pick woven secondary backs added to the cushion. Some of the ATTACHED CUSHIONS have a very smooth and soft urethane back. There will be more in the future.

Though many of these products are very different, they do have some of the same qualities, such as they are all HEAVY! To the manufacturer, this means little, other than it cost more to ship it. Of course, that is built into the cost of the carpet. But for the installer, it is only the beginning. You must staff a project with ATTACHED CUSHION CARPET accordingly. It requires more manpower and equipment to install the carpeting properly. It takes more labor just to fold the carpet back to prepare for spreading the adhesive. Depending on the construction of the carpet, it may take longer to seam.

For example: Let's talk about a solid-color, woven cut-and-loop carpet with a pattern design. The basic seaming procedure for an ATTACHED CUSHION is to row cut the seams. This should **always** be your first option. If the carpet is to "snaky" or the "trueness-to-edge" is not straight, most manufacturers will tell you to trace-cut the seams. That is, to trace-cut one side and then trace-cut the other side to the row-cut side. With a basic loop-pile product, this can be done to achieve an acceptable appearance. However, you still run the risk of fuzzy seams when the carpet is subject to foot traffic, but this example is a woven design product. You can't trace cut the seams, they must be row-cut.

First attempt to make pressure seams. All gaps must be closed in the seams creating overlapped areas. It becomes necessary to push the excess carpet away from the seam area and out of the area that has been glued. With some of the above-mentioned products, this cannot be done. It is not flexible enough to push

the excess carpet away from the seam. The entire breath of carpet will move first.

Another option is to bump the seams together and attempt to close the gaps in the seams using crabs; powerstretchers and several "deadmen." With some products, such as the condensed urethanes, which are very stiff, this will not work. The carpet is not flexible enough. Some of the more pliable products can be stretched in order to close the gaps in the seams. However, the carpet can ease back after a few days, which is partially due to the soft adhesives in use today. The characteristic of some adhesives is to obtain "legs" long after the curing period. This allows a carpet that has been stretched and has a memory to return to its original position, obviously creating gaps in the seams.

The point is an ATTACHED CUSHION product may become very costly for the installer who is not prepared or experienced with installing ATTACHED CUSHIONS. It has been written that "installing a PATTERNED ATTACHED CUSHION product is no different than installing a synthetic secondary-backed product." This is not true! This person has never installed a PATTERNED ATTACHED CUSHION lately, or has restricted his efforts to a 12x12 room that could be installed easily even if it has plywood with fuzz on it.

***The fact is that installing a patterned carpet is a challenge.*** It is expensive for the installer. Installing ATTACHED CUSHION is challenging and definitely costs the installer more to install. Let's not forget to add bowing, skewing and pattern elongation. Now, with a little common sense, one realizes that when these two together, it is going to take more time, more manpower, more equipment, more skill and knowledge to properly install these products. **REMEMBER, a pattern match may NOT always be achievable!**

#### **Not all carpet styles should be sold with ATTACHED CUSHION!**

Do not continue an installation where you can plainly see it will not be accepted by the customer. As a qualified person examining an installation, you will know very quickly that you are in over your head and you will know how and when you got into trouble. Please stop the installation, get help. Continue the installation ONLY when you are confident that your installation will be accepted by the end user. There is no shame in doing whatever it takes to ensure a quality installation. None of us are expected to be perfect, but we, as a Team can get pretty close!

## **SECTION 14 - CONCRETE - MOISTURE as related to the flooring installer**

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### **1. Understanding "pH"**

For many years, the Industry has looked upon moisture as being the primary contributor to flooring failures. As the Industry has become more knowledgeable with information gathered from some specialists in the field, we are finding that the pH level of a concrete substrate has a significant bearing on the success or failure of the applied floor covering such as ceramic tile, carpet, VCT, hardwood, etc.

pH tests determine the strength of salts, known as a base or the strength of acids in a substance, whether in a liquid or solid state. An aqueous solution, which is pure water (distilled) is applied to the substrate and tested by the use of litmus paper or electronic meters. Test results will determine the value of acid or alkali (salts) present in concrete.

Alkali migrates to the surface through the capillaries in the concrete. Water in vapor form is the transport. Alkali can be present in the ground or in the aggregate mix.

The pH scale is logarithmic; the intervals are exponential and thus, represent far greater differences in concentration than the values themselves seem to indicate – each interval is 10 times itself starting from 7. The pH measures hydrogen-ion concentration of solution.

## TESTING the pH of CONCRETE

- The pH scale is from 0-14
- 7 is neutral
- 1 being a strong acid
- 14 being a strong salt (alkali) or base

## THREE TYPES OF TESTS

- 1) PH paper – Litmus
- 2) Liquid Indicators
  - Phenolphthalein liquid - turns red with higher pH or pink with lower pH
  - Rainbow Indicator - reacts to the different values of pH
  - pH pencil - reacts to different values of pH
- 3) Electronic Surface Probes - Digital displays

## CONDUCTING a pH TEST

- Test is to be conducted at same time as moisture test
- Floor must be free of any sealers or contaminants
- Take three tests for first 1000 square feet
- Take one additional test for every 1000 square feet
- Use distilled water for litmus paper
- Use a buffered solution for electronic test
- Phenolphthalein or liquid solutions – pour directly onto slab – can be toxic
- Pour a small amount of water directly onto slab – let stand for two minutes
- Test by placing litmus paper on wet area
- Compare results with scale, usually provided with paper
- ELECTRONIC SCALE provides a numerical readout
- pH turns red with phenolphthalein
- pH turns different shades with Rainbow Indicator

## 2. POROSITY

Webster's Dictionary explains porosity as "possessing or full of pores – permeable to liquids"

Porosity has a direct affect on vapor migration through a slab: The more porous a slab, the more vapor migration can occur. Porosity has a direct affect on adhesives. When conducting pH testing, one can determine the porosity of a slab by watching the water that was applied for the pH:

- If the water absorbs quickly – the slab is porous
- If the water does not absorb – slab has a low porosity
- The more porous the slab, the less open time for adhesive-moisture
- Moisture from the adhesive will absorb into the slab
- The lower the porosity, the longer the open-time is for adhesives
- Moisture needs to evaporate from adhesive, rather than being absorbed into concrete
- Water cement ratios and on-site finishing methods are two key factors determining the amount of porosity a concrete slab will have

### 3. DEW POINT (condensation)

Dew point is another factor that comes into play with all the other concerns regarding moisture, pH and concrete science. What is Dew Point? It is the temperature at which condensation forms. (Review following graph)

### 4. HUMIDITY

Humidity is the amount of water vapor in the air and can be described in different ways. Relative humidity is the term used most often in weather information for the public. Relative humidity is the amount of water vapor in the air compared with the amount of vapor needed to make the air saturated at the air's current temperature or more simply, the amount of moisture in the air in percentage.

### 5. PATCHING COMPOUNDS

**GYSUM BASED:** White in color – lower psi rating – susceptible to mold and mildew Expands during dry out and expands with moisture after it is cured.

**PORTLAND BASED or CEMENTITIOUS:** Usually gray in color – higher psi rating – will not promote mold and mildew – may shrink during dry out period - may need to apply a second coat

**SELF-LEVELING COMPOUNDS:** Used for irregular substrates

### 6. MEMBRANE SYSTEMS

Many of the membrane systems utilize a fiberglass layer to help disperse moisture

- POLYMER COATINGS
- EPOXY COATINGS
- MAT SYSTEMS

### 7. SEALER – PENETRANTS

- Liquid sealers / penetrants are top coatings for a concrete slab and reduce the amount of vapor emissions by filling in the capillaries – usually silicate-based
- Beware of sealers that are ready for floor coverings within 24-72 hours
- Sealers address moisture, but not pH
- Sealers can react with certain adhesives – causing a failure

### 8. REMOVAL of EXISTING FLOOR COVERINGS

Proper precaution and OSHA procedures must be taken if there is an existing floor covering that may contain ASBESTOS. If in doubt, assume that flooring contains asbestos until properly tested.

**For existing and remodel projects, removal must be addressed at the time of the sale! This is critical to the success of the installation!**

A salesperson who is knowledgeable can direct the end user in the right direction and offer the proper corrective procedures, resulting in a successful sale AND installation.

Asbestos removal systems should be used by abatement companies. The majority of installation firms are not experienced or qualified concerning the chemicals necessary for removal or the proper techniques and disposal methods. CFI suggests that a recognized abatement firm be contacted.

## 9. MOISTURE TESTS

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### pH TEST

- **PAPER STRIPS:** Mist or place a few drops of distilled water on the area to be tested. Lay a strip of pH paper on the area and wait about 10 seconds or until the strip appears to have stopped changing color, after which time the color of the paper is compared to the chart that came with the paper. Record the findings. A pH meter is a more accurate method.
- **pH METER:** Either mist or place a few drops of distilled water on the area to be tested. The less water, the more accurate the testing. Hold the testing end of the meter against the dampened area until the meter stabilizes. Read the meter and record the findings. Before testing another area, clean the end of the probe with a clean towel.

### MAT TEST

- Test for moisture by trapping it under a plastic or rubber mat. Clean the floor where you will be placing the mat. Do not wet mop the floor as this will create moisture. Place the mat on the floor. Tape it on all sides with duct tape, sealing all edges.
- Leave the mat in place for 48 hours and then remove. Performing the test in less time, allows for the margin of error to increase.
- Look for droplets of moisture and changes in the floor's appearance when you remove the mat. Is the surface drying (whitening)? Is the duct tape stuck to the floor? If the duct tape is loose or will hardly stick to the floor, this may be an indication of a moisture condition.

### BOND TEST

- This is similar to the mat test except that a section of the floor covering to be installed is used. Apply the adhesive to the floor, allow for the required open time, place carpet into the adhesive. Roll with a roller of recommended weight for the carpet installation.
- Duct tape carpet on all sides. After 72 hours, remove tape, observe if tape is easy to remove indicating a potential moisture condition or is adhesive is adhering, as it should. Is the carpet held tight to adhesive, indicating a good bond? Does the adhesive remain on the back of the carpet instead of the floor or is it wet and stringy? Both indicate moisture problems.

### RH Test - Relative Humidity (RH) Testing

Testing for internal relative humidity of concrete slabs shall 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*.

The purpose of the in-situ test is to measure the slab at the 40% thickness on a slab drying from one side or 20% on a slab drying from both sides. This involves measuring the bottom of the hole at the 40% depth requirement or measuring the entire gradient of the hole to measure the humidity inside. The meters must be calibrated and up to date and acclimated in the hole. The first F2170 test takes three days (drill the hole, place and cap the sleeve that lines the hole, wait 72-hours before taking a measurement), after which the Relative Humidity (RH) is read by using a meter. The RH is stated as a percentage RH, with 75-to-80 percent the acceptable limit. The F2170 test can be repeated without any waiting time as the hole can be reused over and over again. If the initial reading is too high for a floor covering installation, return later, unseal the hole, and read the RH again. There is no three-day waiting period once the hole is drilled and the sleeve is placed and capped. Probes are to be acclimated to site conditions.

Most manufacturers still recommend both the RH probe (ASTM 2170) and the calcium chloride test (ASTM 1869). These tests are completely different. The RH tells how much moisture is in the slab and the calcium chloride test states how much moisture vapor is emitting from the surface. The rh test along with a moisture meter, one that is evasive and non-evasive is what many in our industry use.

## 10. MOISTURE – ALKALINITY – POROSITY - HUMIDITY VOCABULARY

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1. It is not the responsibility of the installer to conduct moisture testing, but it is **the installer's responsibility to make certain that the moisture tests were conducted and the results are documented for future reference before starting the installation of flooring.**
2. **Calcium Chloride testing** ASTM 1869
3. **In-situ rH probe testing** ASTM 2170
4. **MAT TEST** - qualitative test that ONLY checks for moisture using a plastic or rubber mat left in place for 48hrs.
5. **Efflorescence** – residue deposited on the surface of a material by the crystallization of soluble salts.
6. **pH** tests determine strength of salts, known as base or strength of acids in a substance, whether a liquid or solid state.
7. **pH of concrete neutral is 7. Strong salt (alkali) is represented by a 14 reading.**
8. **pH tests** are conducted at the same time on floors free of sealers and contaminants. 3 tests are taken for the first 1000-square feet and one additional test for every 1000-feet thereafter.
9. The **more porous the slab**, the more vapor migration occurs
10. The more porous the slab, the **less open-time** for adhesive.
11. **Dew Point** is the temperature at which condensation forms
12. **Humidity** is the amount of water vapor in the air
13. **Relative Humidity** is the amount of moisture in the air in percentage

### The Latest Testing Methods

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Six methods for concrete moisture testing; the first three should never be used to make a decision about whether a concrete slab is ready to have a floor installed.

**The senses test:** “It looks dry,” “It feels dry” and/or “It smells dry.” Many jobs go forward based on this test method. Unfortunately, you can’t see, feel or smell moisture coming out of a concrete slab, so using this method to decide if a slab is ready is just plain foolish.

**The plastic sheet test:** Many have used a plastic sheet taped to the floor as a way of testing for moisture. Tape down the sheet, come back in a few days and if it is dry under the plastic, lay the floor. The problem is that this method is influenced by atmospheric conditions and is not accurate. We have seen side-by-side tests on a slab that had very high readings on the calcium chloride test, but the plastic sheet right next to it was completely dry. If you use a plastic sheet, beware! Dry may not be dry!

**Moisture meters:** Concrete moisture meters are a “spot check” at a given moment in time, but they give no indication of long term moisture conditions and there are no flooring or adhesive manufacturers who will accept this method as a “go-or-no-go” test for installing flooring over concrete. Meters are useful for testing the dryness of gypsum underlayments, for trouble shooting of concrete-related flooring failures, and to identify locations in the concrete that are “wetter” than others so they know where to place moisture tests.

The following three methods are ASTM Industry standards\*\* that have been developed to provide accurate and repeatable results.

**Calcium Chloride Test Method:** ASTM F 1869, *Standard Test Method for Measuring Moisture Vapor Emission Rate (MVER) of Concrete Subfloor Using Anhydrous Calcium Chloride* is a test that has been around almost 50 years and is widely used but often done incorrectly. The four most common mistakes when doing the ASTM F 1869 test are:

**Wrong conditions:** The test must be done when the building is at the same temperature and humidity it will be when the space is occupied. If there is no heat or air conditioning, don’t do the test because the results will not be valid!

**No Preparation:** The F 1869 method calls for cleaning a 20-inch-by-20-inch square at each test site to be sure you are testing bare concrete. This will remove curing compounds, sealers or old adhesive residue. The people who perform testing as a source of income always lightly grind the surface so the slab is completely clean. Failure to clean the slab may result in a false low reading.

**No Waiting:** ASTM F 1869 calls for a 24-hour waiting period after cleaning before the test kit is placed so surface moisture that was trapped beneath whatever coating was there can evaporate. Failure to wait 24 hours may result in a false high reading.

**Too few tests:** For all concrete moisture test methods, go “by the book” and do three tests for the first 1,000-square feet and one test per 1,000-square feet after that.

Even when done correctly, the calcium chloride test has limitations because it only **measures moisture vapor emissions from the very top of the slab** – less than 1-inch down. Because most concrete slabs dry from the top down, they are often dryer at the top than on the bottom, until covered with flooring. When these slabs are covered, the moisture down below moves upward, is blocked by the floor covering and trapped in the adhesive layer, turning it to mush.

Two methods have been developed that are able to “look deep” into the concrete to see if there is any moisture waiting to come to the top.

**Relative Humidity “Probe” Method ASTM F 2170**, *Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In Situ Probes* involves drilling holes to 40-percent of the slab thickness – usually 2 -3 inches down. This measures moisture inside the slab, which is thought of as a more accurate way of predicting what will happen in the future. Unlike calcium chloride testing, relative humidity probes are less sensitive to fluctuations in ambient air humidity and temperature above the slab. Many areas within the industry are moving towards RH testing.

**Relative Humidity “Hood” Method ASTM F2420** *Standard Test Method for Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood* is a brand new method here in the United States that has been in use in Europe for a number of years. It was approved as an ASTM standard in 2005. It has not yet started to make its way into manufacturer’s installation instructions, but it may in the future. Like the ASTM F 2170 method, this test also measures relative humidity, but on the surface instead of inside a hole in the concrete. Test seems similar to the calcium chloride test. How is it better?

The hood method measures the amount of free water in the concrete and the calcium chloride kit measures how much vapor is being driven off the surface. One of the reasons humidity testing in concrete is becoming more popular is that these methods are not as sensitive to atmospheric conditions unlike the calcium chloride test kits. The hood method is measuring the equilibrium relative humidity of the concrete in exactly the same way ASTM F 2170 is and is gaining popularity due to the fact no drilling is required.

***Does it have a correlation to the ASTM F 2170 test?***

They both measure the equilibrium relative humidity. The hood method measures close to the surface and humidity probe tests measure at the 40-percent depth of the concrete. Readings from the hood method tend to be 5-percent lower than with the sleeve method.

The floor covering industry would do well to stay up on the latest methods for moisture testing. Installers should know these methods in case an employer asks them to do one, and also because there will be opportunities for work from these independent testing agencies as more and more testing is done in the future.

Flooring retailers and contractors need to be aware too, and be more knowledgeable than their customers or the general contractors. If there is moisture-related floor covering failure and the floor was not tested before installation, then there is a lot of finger pointing after the fact. Even worse, if the testing was done and not done correctly, then whomever did the testing can be held responsible and the costs are enormous.

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## Section 15: SEAM PEAKING CORRECTIVE MEASURES

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Seam peaking and seam elevation are inherent characteristics of all seams. This occurs when the carpet is stretched. The hinging motion causes the seam to become elevated, which in turn creates the peaking effect. This does not occur in direct-glue or double-glue installations. The problem can be solved **IF** the cushion meets the requirements of this procedure.

### THE CORRECTIVE PROCEDURE:

This procedure will not correct the appearance of the seam, but it will correct seam peaking or seam elevation. It is important to note that the cushion will have an effect on the success of this procedure. It will NOT work over soft cushion that does not have a scrim (urethane). **The cushion must be dense with a scrim.** Room must be empty.

1. Remove carpet *from tackstrip* and pull it back to where the seam tape is visible. If the seam was originally constructed improperly on top of cushion, the tape left an impression on the surface of the cushion. Move to the right or left of this impression six inches and cut cushion. To identify seam location later if it was correctly constructed, place masking tape at each end of the seam on wall base BEFORE removing the carpet.
2. Pull the cushion back and apply the **pressure-sensitive** adhesive using a 1/16" x 1/16" x 1/16" square-notched trowel. Apply adhesive under the impression left on the cushion approximately one-foot on both sides of where the cushion was cut. Allow the pressure sensitive adhesive to become "tacky" before positioning the cushion into the adhesive.
3. **Do NOT take the seam apart.** **Lightly, sand the back of the seaming tape** to remove the silicone as it is not compatible with the adhesive.
4. Apply a **double-glue or soft-set, multi-purpose adhesive** to the top of the cushion the width of a trowel (1/8" x 1/8" x 1/16" U-notched trowel), approximately 10-12 inches, directly over the impression of the tape.
5. Position the carpet in the adhesive while it is **wet**.
6. **Immediately,** reinstall the carpet using the powerstretcher. Stretch more on the length, if necessary, and less on the width. Stretch the carpet across the seam back to the original stretched position. **DO NOT OVERSTRETCH!**
7. **After** the carpet has been edged into the gully, stretch the length of the seam using the required pressure to obtain a flat seam.
8. **Roll the seam with a smooth seam roller** to ensure that the adhesive has been transferred into the backing of the carpet.
9. A flat weight, such as a 2 x 10 or 2 x 12, should be positioned over the seam for approximately 45-minutes. This will allow time for the adhesive to become tacky and pull the seam down.
10. Advise the customer that the area is not to receive foot traffic for 24 hours.

**REMEMBER,** this procedure will not work IF the cushion is manufactured without a **scrim or the density factor of the cushion is not sufficient**. The adhesive will migrate into the cushion causing the cushion to collapse. A cushion of 6lbs.or heavier is recommended.

**BEFORE, procedure is attempted, ALWAYS identify the cushion!**



## Section 16: The Flooring Installation

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***Just as important as the flooring sale.....is the contractor hired to install it.*** The installation may encounter many problems, such as excessive moisture and poorly completed seams. Flooring installers must be aware of these pitfalls.

It's easy to underestimate the scope of work involved in a commercial flooring installation project and to assume anyone can handle the work.

Experienced flooring contractors agree that the most common problem in flooring projects is the presence of excessive moisture in the sub-floor. This usually is a result of compressed construction schedules, which leaves little time for concrete sub-floors to dry properly.

Moisture can cause problems in several ways. If hard-surface flooring is installed over a sub-floor with high moisture content, the water will not be able to escape through the floor. That can create a breeding ground for mold. Excessive moisture in the sub-floor also can keep the flooring adhesive from gripping adequately.

High moisture levels aren't the only reason that flooring adhesives fail. The curing compound used in the cement sub-floor may prevent the flooring adhesive from properly holding. As a result, it may be necessary to "bead blast" the cement. This is the use of a machine that shoots steel pellets into the cement to break up the surface area, allowing for a stronger bond between the floor and sub-floor.

Another potential problem occurs when the sub-floor has imperfections, such as areas that are patchy or uneven. With linoleum and some other hard-surface floors, these can be seen through to the floor. An experienced flooring installer will check for such flaws before proceeding with a job.

To increase the likelihood that a job will go smoothly, the job specifications must be clear and detailed. Sufficient time must be allowed for the flooring project to proceed at a reasonable pace. Unfortunately, that doesn't always occur. Flooring is usually at the end of a long project, and the timeline for installation tends to be compressed. And this is where the problems begin.

**Rushing the installation process can backfire!** For instance, if the schedule must be accelerated, the contractor may use multiple crews or work overtime. Both of these increase the need for coordination and supervision, and almost always mean a higher cost.

**Most importantly, hiring qualified, experienced and competent flooring installers will help ensure that a floor covering looks good and performs well.** CFI flooring contractors certified to the required level with a history of experience and satisfied clients in a specific market are among those who will perform to the customer's expectations. It is extremely important that the flooring contractors have received thorough training. The days of "I've been doing this 20 years" are gone. Today, the most important question is "When was the last educational/certification flooring installation training you attended?" Methods change; tools change and requirements change. Training is a top priority!

A qualified contractor who stays up to date on flooring technology also is able to point out techniques that will make a job proceed more smoothly. For instance, new lift systems can hoist heavy shelving units — in libraries, for instance — so that the floor can be installed without having to remove all the items from the shelves.

What's more, working with an experienced floor covering installer often costs less in the long run than hiring less-experienced crews. In fact, inexperienced or sloppy contractors can generate extra costs in several ways.

Installation is a very small percent of the overall life cycle cost, but often the most important segment to achieve customer satisfaction.

## Section 17: REQUIREMENTS FOR CFI CERTIFICATION

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All Installers achieving CFI Certification must agree to abide by the CFI Pledge and follow manufacturer's recommendations. Special installation techniques required by the manufacturer for designated carpets are not included in the CFI Certification.

### CFI Certification Levels

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The Installer who successfully completes the described category has demonstrated to the Certifier the ability to perform work as listed below. CFI looks forward to your participation in completing the advanced levels of certification as a professional.

**RESIDENTIAL-I** Lightweight, base-grade, tufted carpet with installation in track houses, apartments, manufactured housing, etc. Two years experience required. If assistance is received, R-II is NOT available at that date.

- Answer written and oral questions for R-I
- Successfully complete EPA and OSHA tests
- Figure diagram with seam placement and yardage
- Demonstrate proper powerstretching techniques
- Construct length grain / crossgrain seams for stretch-in and direct-glue
- Correctly apply seam sealer/latex
- Upholster stair with spindles
- Understand basics of pattern alignment
- Understand floor preparation and doorway terminations
- Identify 5 carpet backings & required installation techniques
- Demonstrate the technique of top row cutting

**COMMERCIAL-I** Lightweight, base grade carpet installed in small commercial, single office or small retail establishments. Two years experience required. If assistance is received, C-II is NOT available at that date

- Answer all written and oral test questions for C-I
- Successfully complete OSHA and EPA Test
- Figure diagram with seam placement and yardage
- Identify 5 carpet backings & required installation techniques
- Recognize floor preparation procedures
- Apply seam sealer/latex correctly
- Demonstrate the technique of top row cutting
- Understand correct adhesive and proper trowel sizes
- Understand temperature and moisture issues
- Terminations of carpet to other surfaces / wallbase
- Demonstrate proper use of powerstretcher and pattern matching
- Install upholstered stair

**RESIDENTIAL-II** More detailed berber, dense-cut pile, and patterned. Four years experience required. No assistance during testing to receive R-II.

- Excels in Residential-I Skills in addition to:
- Answer written and oral questions for R-I and R-II
- Construct length grain / crossgrain seams in stretch-in / direct-glue
- Upholster stair with spindles in specified carpets
- Perform more advanced skills testing
- Identify 12 carpet backings & required installation techniques

**COMMERCIAL-II** More detailed commercial installations, including double-glue installations, patterns. Four years experience required. No assistance during testing to receive C-II.

- Excels at requirements of Commercial-I in addition to:
- Install dense cut piles, patterns, loops, graphics, and woven proficiently
- Double-glue installations
- Attached cushion backings and installation
- Is proficient at installation of patterned merchandise
- Install all types of stairs proficiently
- Installs border – Construct seams/hot melt – direct glue
- Practices the importance of communication and teamwork
- Possess ability to read blueprints and understand roll sequence
- Identify 12 carpet backings & required installation techniques
- Identify cushion and correct application
- Site conditions – must be proficient concerning moisture, alkalinity, and correction of bow-skew-pattern elongation

**MASTER II** Master-II Skills Testing (Hands-on) is available only at scheduled Master-II three-day Certifications

### CFI Study Guide

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The CFI Study Guide is a four-page document designed to assist with the written tests. Most answers are included in this material. Upon receipt of registration, the CFI Study Guide will be sent. It is also available at the website, [www.CFIinstallers.org](http://www.CFIinstallers.org). For those who are testing in the commercial field, additional information can also be accessed for study. The written test contains information that professional Installers must know in order to communicate with others in the industry and their clients. It is a multiple-choice test. A vocabulary and backing test are also given. **PREPARATION is the KEY!** The tests are not difficult when **YOU** are prepared!

The complete CFI Advanced Study Guide is available online at [www.CFIinstallers.org](http://www.CFIinstallers.org).