

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

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

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

### **Understanding Patterned Carpet**

The following overview describes how patterns in carpet are created.

Using pre-colored or pre-dyed yarns, patterns may be created in any of the following construction methods:

- Woven - Axminster Weave, Wilton Weave, Velvet Weave
- Knitted
- Tufted - graphics or various computer controlled techniques

Patterns can also be produced after the carpet is woven or tufted using undyed yarns and the pattern applied afterwards - a post-dyeing method. Commonly used are:

- Screen Printing - flat and rotary
- Injection Dyed - computer controlled processes whereby colorant is injected into the carpet pile

Regardless of the method of construction, slight variations in yarn tensions, yarn feed, etc. can create changes in pattern configuration.

Patterns created by the tufting process, tufted graphics, as well as screen printed and injection dyed carpet, require processing and finishing after the pattern is created. All of the subsequent finishing processes affect the size, straightness, and squareness of the pattern.

### **Pattern Variations**

Pattern variation can be characterized by four conditions that may be found on any patterned carpet. The possible existence of all these variations must be considered when specifying and bidding any project where broadloom patterned carpet is to be installed. These conditions are 1) pattern bow, 2) bias, 3) repeat variation, and 4) trueness of edge. All patterned carpets are subject to these conditions.

Variations in pattern are normally described by the measurement of these four conditions, performed on a single uninstalled breadth of carpet, as described below:

**Pattern Bow** - To measure, stretch a string across the width of the carpet from match point on one side to the corresponding match point on the opposite side. These reference points should be as close to the selvage as possible. Measure the distance of greatest separation between the string and the pattern line. Uncorrected pattern bow is visible on the floor as wavy or crooked pattern lines when viewed across seams.

**Bias or “Skew”** - This describes the squareness of the pattern. This condition is measured using one of the methods described below.

#### **Diagonal Difference Method**

Step 1 - Take the same two pattern points previously identified in the pattern bow measurement and mark with masking tape or white chalk as A and B.

Step 2 - Using a steel tape, measure exactly 9 feet from these points parallel to the selvage, allowing the steel tape to follow the same length pattern line. These points should also be marked with tape or white chalk as C and D.

Step 3 - Measure diagonally from A to C and from B to D as indicated. If diagonals are equal, the pattern is perfectly square. The degree of inequality indicates severity of bias.

#### **T-Square Method**

Step 1 - Using a 4 foot T-square or long carpenter square, align the short edge of the square along one selvage edge.

Step 2 - Making sure the square's short side is perfectly parallel to the carpet pattern, place one end of a white chalk line at the corner of the square.

Step 3 - Pull the chalk line tight and make sure it stays parallel to the long side of the square.

Step 4 - Follow the pattern and line across the carpet width. The difference between the pattern and line will be the amount of skew or bias. On a job site, uncorrected bias is visible as the pattern running parallel with two opposing walls and running into or away from the other two walls.

**Repeat Variation (Length)** - This variation is sometimes referred to as “pattern run off” and is determined by a direct measurement methods as follows.

Step 1 - Determine specified length pattern repeat in inches.

Step 2 - Divide this number into 144 inches. This usually results in a whole number. Example, if a carpet is specified as having an 18 inch match, determine the number of repeats in 12 ft (144 inches) by dividing 144 by 18, which equals 8. Use this number (in this example “8”) and go to step 3.

Step 3 - Measure the distance covered by this number of repeats in numerous places through the dyelot.

Step 4 - Use these numbers to sequence cuts working from longest repeat (largest number) gradually down to the shortest repeat within the dye lot. Uncorrected pattern variation (width or length) is visible on a job site as seam mismatch.

Width pattern repeat variation can be determined in the same manner. From an installation standpoint, this is important only on end-to-end or “cross” seams.

**Trueness of Edge** - To measure, stretch a string or white chalk line, at least 40 feet long if possible or as specified by manufacturer, near the selvage of the carpet. Both ends of the tightly stretched string should be on the same point in the pattern. Trueness of edge is the maximum separation or distance between the string and the pattern line.

Uncorrected variation in edge trueness is visible on the job site as wavy or serpentine pattern lines when looking down the length of the carpet.

## **Is There an Industry Standard?**

Because there are no “industry standards” for pattern variation, the carpet manufacturer should be responsible for providing, before the installation, written specifications as to the degree of variations expected, the degree of installed mis-match (if any) considered acceptable, and any guarantees or warranties of pattern match offered.

### **When selecting patterns, remember:**

- Large patterns tend to decrease the apparent size of an area.
- Large expanses of floor space generally require larger and bolder patterns. When placed in a large room, such as a ballroom, smaller patterns tend to lose definition and will have the appearance of a tweed. Smaller patterns are best used in smaller areas and where there are fewer seams.
- The larger the pattern, the easier to match and install.
- Patterns with high degree of linearity, such as plaids or stripes, present more difficult installation challenges.

### **When planning the installation, remember:**

- Although exact pattern match is usually not guaranteed, manufacturers will provide tolerances and specific installation instructions.
- The installation method selected may influence the degree of pattern adjustment that can be realistically expected. The amount of adjustment possible will vary with the backing system selected.
- Pattern adjustment during installation is possible and expected.
- Relaxing carpet by unrolling in a room for 24 hours under controlled conditions as directed by CRI-104, *Standard for Installation of Commercial Carpet* will help facilitate adjustment for pattern variations.
- Power stretchers and stay nailing are commonly required even in glue-down installations.
- Time requirements, thus labor costs, will not be the same as for installation costs of plain goods.