



# **Installation Systems**

## ARMSTRONG STRATEGIC ACCOUNTS RECOMMENDED SHEET FLOORING ADHESIVES AND INSTALLATION SYSTEM

Product	Installation System	Adhesive	Comments
Avantra Cambray Chelsea Corner Concerto Deco Collection Designate Epiq Landmark Medley Metro Millcreek Park West Renaissance Royelle Signia Themes	Residential Felt-Backed  Full Spread	S-235, S-254 or S-224	Seams—Double cut  Seam Treatment— Prepare seams with S-585 and apply S-570
Caspian II Chamblis Sentinel Sundial	Modified Loose Lay method	Glass-tac Tape	Seams—Double cut  Seam Treatment— Prepare seams with S-585 and apply S-570
Ashton Kempton Premier	Modified Loose Lay method	Vinyl Flooring Tape	Seams—Double cut  Seam Treatment— Prepare seams with S-585 and apply S-570

## RECOMMENDED TILE FLOORING ADHESIVES AND INSTALLATION SYSTEMS

Tile	Installation System	Adhesive	Comments
Urethane No-Wax (Dry Back)	Vinyl Composition Tile Full Spread	S-89, S-515, S-700 or S-750	Roll with 100-lb. roller
	----- Tile-On	S-515, S-750 or S-230	
Vinyl No-Wax (Dry Back)	Vinyl Composition Tile	S-515 or S-750	Roll with 100-lb. roller
NATURAL LIVING NATURAL PERSONALITY	Residential LVT Planks	S-288	Roll with 100-lb. roller
Alterna	Alterna (Traditional and Grouted tile installation methods)  Full Spread	S-288	Roll with 100-lb. roller  For grouted installations, use S-693 Premixed Sanded Acrylic Grout
PERSPECTIVES	Commercial Vinyl-Backed	S-599 Set-in-Wet  S-240 in concentrated static and dynamic load areas	Porous substrates only.  Set-in-Wet and roll with 100-lb. roller

# Vinyl Composition Tile Installation System

Product	Adhesive/Full Spread	Adhesive/Tile-On	Comment
Imperial Texture MultiColor RAVE Stonetex Companion Square Feature Tile/Strips	S-89, S-515, S-700 or S-750	S-515 or S-750	Stonetex—lay with directional arrows pointing in the same direction.
ARTEFFECTS	S-89, S-515, S-700 or S-750	S-515 or S-750	For best overall visual effect, install with the directional arrows pointing in the same direction.
SAFETY ZONE	S-89, S-515, S-700, S-750 or S-230	S-515 or S-750	Roll tile with 100-lb. roller. Lay arrows in same direction. For S-230, follow instructions for Specialty Areas.
Vinyl No-Wax (Dry Back)	S-515 or S-750	S-515 or S-750	Roll tile with 100-lb. roller
Urethane No-Wax (Dry Back)	S-89, S-515, S-700 or S-750	S-515 or S-750	Roll tile with 100-lb. roller

## Suitable Substrates:

All substrates listed below must be properly prepared and meet the requirements discussed in Chapter IV, Subfloors and Underlayments. There may be certain exceptions and special conditions for these substrates to be suitable for the Vinyl Composition Tile Installation System.

### Full Spread:

- Concrete
- Approved Suspended Wood
- Steel, Stainless Steel, Aluminum, Lead, Copper, Brass, Bronze
- Ceramic Tile, Terrazzo, Marble
- Polymeric Poured (seamless) Floors

### Tile-On:

- Existing Resilient Sheet Floors
- Vinyl Composition, Vinyl Asbestos, Asphalt, Rubber and Vinyl Tile-on Grade or Suspended Only

## Job Conditions/Preparation:

- Substrates must be dry, clean, smooth and free from paint, varnish, wax, oils, solvents and other foreign matter. In renovation or remodel work, remove any existing adhesive residue\* so that no ridges or puddles are evident and a thin, smooth film remains.

\*Some previously manufactured asphaltic "cutback" adhesives contained asbestos (see warning statement on page xii). For removal instructions, refer to the Resilient Floor Covering Institute's publication Recommended Work Practices for Removal of Resilient Floor Coverings.

- When using S-230, remove any existing adhesive residue\* so that 80% of the overall area of the original substrate is exposed. If these requirements are not followed, curled and/or loose tile could result. For Tile-On, remove wax or other finishes with a commercially available liquid wax stripper. Replace or repair indented or otherwise damaged areas.
- Allow all flooring materials and adhesives to condition to the room temperature a minimum of 48 hours before starting the installation.
- The area to receive resilient flooring should be maintained at a minimum of 65°F (18°C) and a maximum of 100°F (38°C) for 48 hours before, during and for 48 hours after completion. **When using S-230 Epoxy Adhesive the maximum room temperature should not exceed 85°F (29°C).**
- During the service life of the floor the temperature should never fall below 55°F (13°C). The performance of the flooring material and adhesives can be adversely affected below this minimum temperature.
- Conduct calcium chloride tests or percent relative humidity tests. Bond Tests should also be conducted for compatibility with the substrate. Please refer to Chapter IV, Subfloors and Underlayments.
- Radiant-heated substrates must not exceed a maximum surface temperature of 85°F (29°C).
- Concrete floors should be tested for alkalinity. The allowable readings for the installation of Armstrong flooring are 5 to 9 on the pH scale.

### Fitting:

See Chapter VII, Layout and Fitting, for room layout.

Before installing the material, plan the layout so tile joints fall at least 6 (15.2 cm) away from subfloor/underlayment joints. Do not install over expansion joints.

When installing over an existing resilient floor, plan the layout so the new joints are a minimum of 6 (15.2 cm) away from the original seams. When installing over tile floors, joints should fall in the center of the tile.

When installing 12 × 12 (30.5 cm × 30.5 cm) tiles, avoid having border pieces less than 6 (15.2 cm) wide.

**Abutting Different Gauges of Resilient Flooring:** When installing thinner gauge material next to thicker gauge materials, install thicker material first and then butt a 12 (30.5 cm) wide piece of S-153 Scribing Felt against the thicker material. Adhere the Scribing Felt to the subfloor with S-235 Adhesive. Use the fine notching of the Armstrong S-891 Trowel over nonporous substrates such as existing resilient flooring, and use the regular notching of the Armstrong S-891 Trowel over porous subfloors such as wood and concrete. Use Armstrong S-184 Fast-Setting Cement-Based Patch and Skim Coat or S-194 Patch, Underlayment and Embossing Leveler to feather the edge of the S-153 Scribing Felt to the level of the substrate. Allow the patch to dry completely before installing the flooring. Scribing Felt is not recommended to be used under the entire installation.

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**VII**



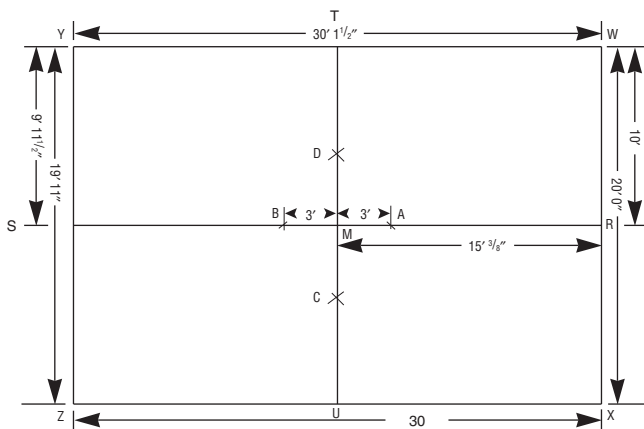
# **Layout and Fitting**



## **B. RESILIENT TILE**

### **1. Square Layout**

Methods for laying out the room are the same for all kinds of resilient tile. However, there are two major types of patterns: designs laid on the square and designs laid on the diagonal. For either type of pattern, it is first necessary to center and square off the room. The basis for all resilient tile installations is careful layout.



**Fig. 50**

If the room is rectangular with practically parallel walls on all sides, find the center. For instance, in Fig. 50, wall WX is 20 , wall YZ is 19 11 , wall XZ is 30 and wall WY is 30 1-1/2 .

Carefully measure across wall WX and wall YZ to find the midpoints at R and S. In this case, WR is 10 and YS is 9 11-1/2 . Strike a chalk line on the floor between R and S.

Next, find M, which is the midpoint of line RS. At M, strike a chalk line TU at a right angle to RS. In this case, midpoint M is 15 3/8 from both R and S. To make the line TU exactly at a right angle to line RS, proceed as follows:

- With M as a center point, measure any convenient distance on line RS. Mark the substrate at these two points A & B. These lines will act as reference points to make arcs C & D.
- With A as a center point, construct an arc any distance greater than the distance between A & M. Construct an arc on both sides of T and U.
- With B as a center point and using the same radius as used with A, construct another arc on both sides of T and U.
- Arcs from A & B will cross each other at points C & D. Through points C, D & M, strike a line TU which is exactly at a right angle to RS.

If carefully done, this method is more accurate than using a square to strike the right angle, especially in larger rooms.

In rooms with bays or alcoves in the walls, the method is the same except that centers R and S are found at the points shown in Fig. 51. Then, point M is found midway between R<sub>i</sub> and S<sub>i</sub>. Before installing, lay the tile dry or measure to find out the size of the pieces at the wall line. For example, consider the layout of a design using 12 × 12 tile laid in a room 15 4 × 20 8 (Fig. 52).

After striking center lines AB and XY, lay the tile dry from point M to wall B and from point M to wall X. The distance between M and X is 7 8 and between M and B is 10 4. When the 12 × 12 tile are laid from the center to the wall, the last row of tile at walls X and Y will have to be cut to 12 × 8 . At

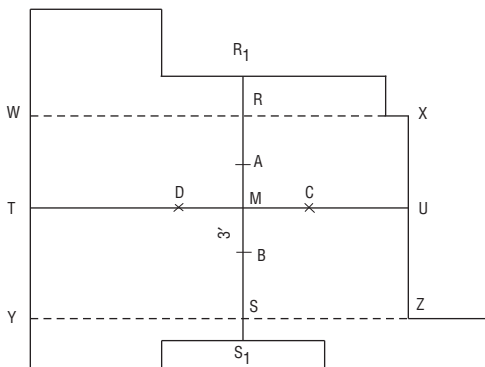


Fig. 51

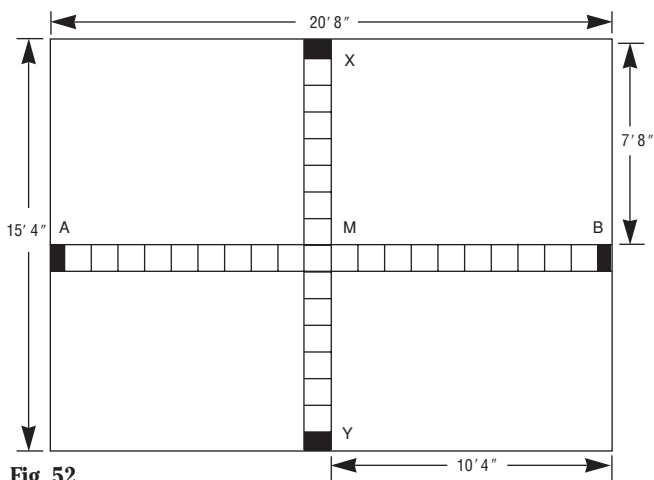


Fig. 52

walls A and B, the last row of tile must be cut to  $12 \times 4$ . The tile at opposite walls should be of equal size and at least half a tile. Since walls A and B are not at least half a tile, an adjustment must be made (Fig 52).

The adjustment is to move line XY. Another chalk line is struck parallel with XY but 6 (one half the width of a  $12 \times 12$  tile) to either side of XY. The distance from this line to walls A and B becomes  $10' 10''$  and  $9' 10''$ , respectively. The fit pieces of tile along the last row of walls A and B will now be  $12 \times 10$ . This new line is  $X_1Y_1$ . Eliminate the old center line XY (Fig. 53).

The row starting at the new center  $M_1$  and running along line  $M_1X_1$  will include seven full  $12 \times 12$  tile plus one tile that must be cut to  $12 \times 8$ . Line  $M_1B$  will include nine full tile plus one tile that must be cut to  $12 \times 10$ . The  $12 \times 10$  tile along walls A and B balance with the  $12 \times 8$  tile along walls X and Y.

If the dimensions for walls X and Y also had allowed only small strips of tile to be used at the walls, the center line AB could have been adjusted in the same manner.



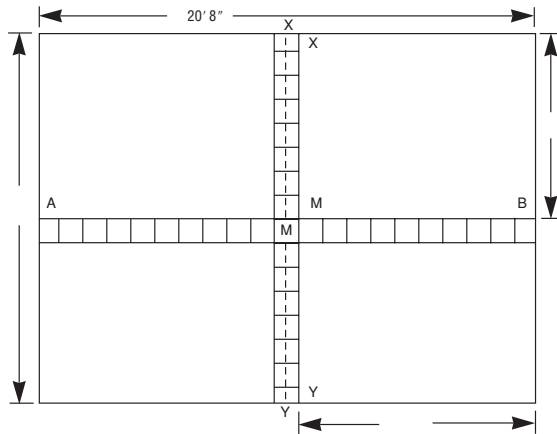


Fig. 53

## 2. Diagonal Layout

For diagonal layouts, square off the room and strike center lines as for square layouts. Then set up diagonal lines (Fig. 54). With point M as a center and using any convenient radius, mark points A, B, C and D on lines SR and TU. With B and C as centers, and using a radius greater than the distance between points C and M, mark intersecting arcs at E. With A and D as centers, mark intersecting arcs at F. Strike an extended chalk line YZ through EMF to the walls. With A and C as centers, mark intersecting arcs at G. With B and D as centers, mark intersecting arcs at H. Strike an extended chalk line WX through GMH to the walls. To find the number of tile across the room, lay a row of tile dry—point to point—along each center line (Fig. 55).

The point at which a diagonal design is started depends on the size of the room. When a diagonal design includes more than one color, a border is generally desirable. With two or more colors, it is necessary to start with one tile on center so that the design will come out with a half tile of the

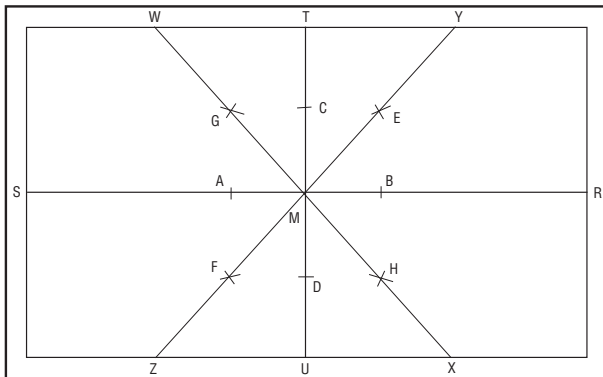
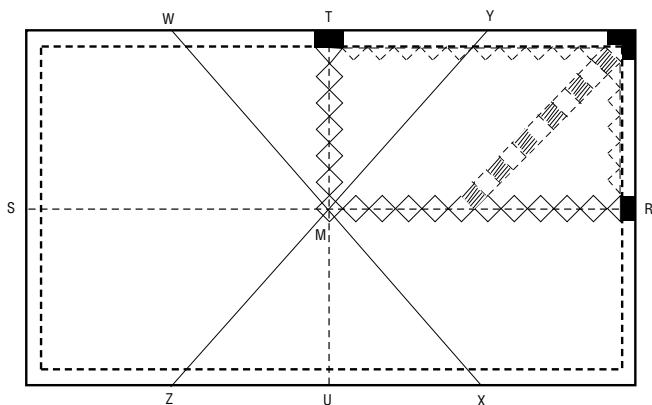


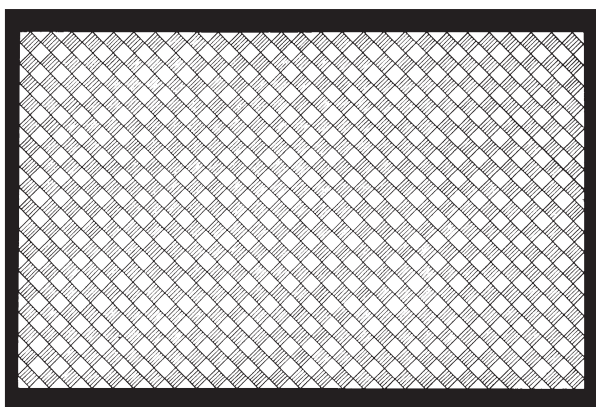
Fig. 54



**Fig. 55**

same color along walls T and R and a quarter tile in the corner. Adjust the size of the border to permit the use of full and half tile at the edges of the field. That will eliminate the need to cut odd-sized diagonal tile to fit around the sides of the room. For example, if white half tile are wanted on border, start with white tile on center. For black half tile on border, start with black tile on center. This would not apply to a one-color floor.

When a design is properly laid on the diagonal, all half tile at the border or wall line should be of one color and quarter tile should be used in each corner (Fig. 56). When using two or more colors of resilient tile in diagonal designs, the graining of the half tile at the border should run in the same direction direction as the graining of the corresponding color of full tile (Fig. 57). Two types of half tile are required. They are known as right half tile and left half tile. In right half tile, the grain runs up to the right from the longest side of the half tile. In left half tile, the grain runs up to the left from the longest side of the half tile. With the grain of the full tile running from top to bottom, right half tile



**Fig. 56**

are cut on a diagonal from the lower left corner to the upper right corner and left half tile are cut on a diagonal from upper left corner to lower right corner. The diagonal side becomes the edge that will be butted against the wall side. Depending on the size of the room, it may be necessary to start the design with the corners of four tile on midpoint M to obtain half tile of the same color along walls T and R and a quarter tile in the corner (Fig. 58). To change the color of the half tile in this case, reverse the colors of the four tile at the center.

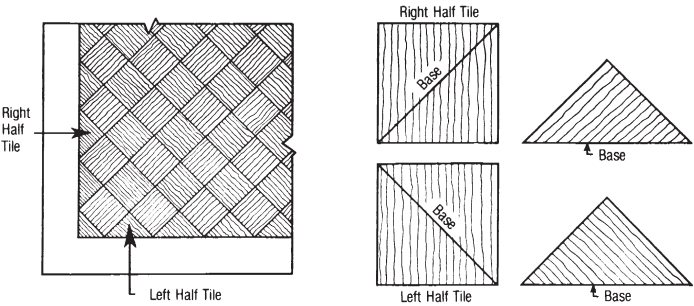


Fig. 57

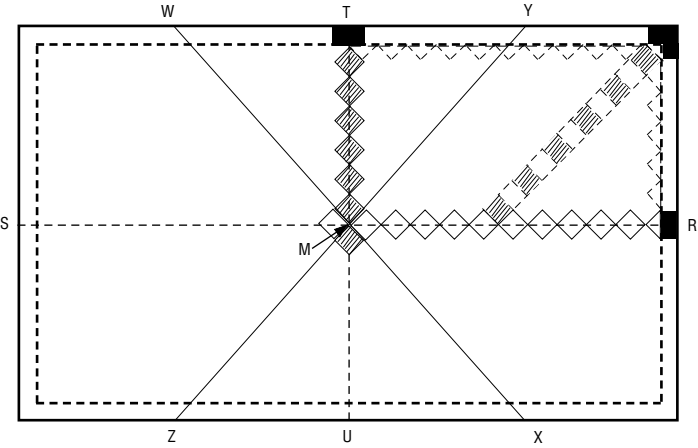
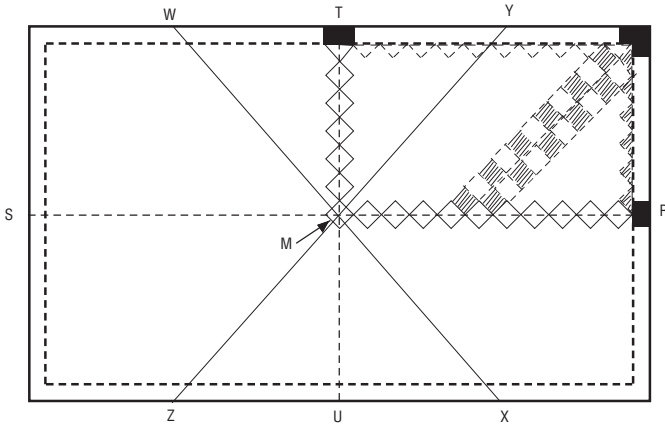


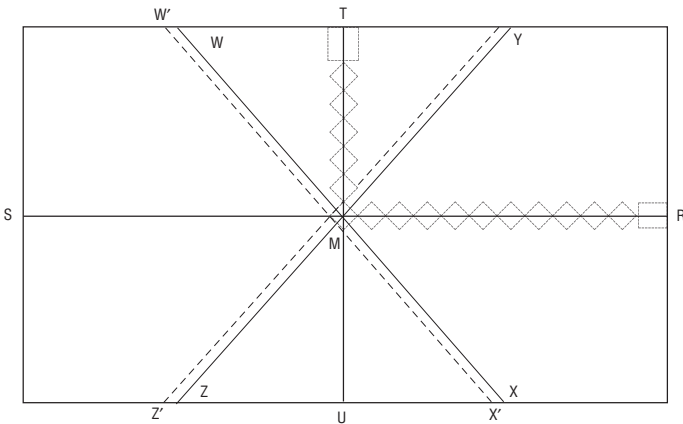
Fig. 58

Fig. 59 is an example of a diagonal design laid out incorrectly. Although the border width is in proportion for the room, half tile along the border at wall R are black, and half tile along the border at wall T are white. This incorrect diagonal design can be easily corrected without changing the width of the border by beginning the job with four tile on the center line (Fig. 58).

If dry fitting the tile shows the center tile should be placed squarely over midpoint M for proper border width (Fig. 55), it will be necessary to set up diagonals  $W_1X_1$  and  $Y_1Z_1$ . Mark diagonal lines  $W_1X_1$  and  $Y_1Z_1$  half the width of a tile away from, and parallel to, the diagonal lines  $WX$  and  $YZ$  (Fig. 60).

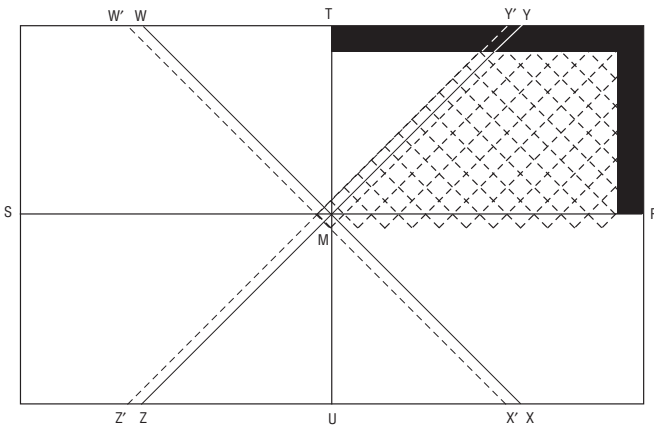


**Fig. 59**



**Fig. 60**

After locating diagonals, spread adhesive and install tile following the diagonal center lines (Fig. 61). Using the starting point established after dry fitting, fit the center tile into position at the junction of lines  $WX$  and  $YZ$  or  $W_1X_1$  and  $Y_1Z_1$ . Lay diagonal designs with the first row fit along the diagonal center lines of the layout.



**Fig. 61**

### 3. Spreading Adhesive

After properly preparing the subfloor and establishing the center lines and layouts, spread the proper adhesive with a notched trowel. Spread the adhesive over half the room. You can handle materials in the clear half of the room without getting into the adhesive and tracking it over the new floor.

Give the adhesive ample time to set up before the tile is installed. Humidity and temperature changes will affect the length of time for the adhesive to set up. To test for proper set, lightly press your finger over the adhesive surface at several locations. If adhesive feels dry-to-touch, it is ready for tile installation. If the adhesive sticks to your finger, additional drying time is needed.

To avoid losing the center line when spreading adhesive, leave a small exposed spot where the lines cross and another spot where the line meets the wall. If the center line is very long, you may want to leave additional spots every few feet along the line. Then using the exposed sections of the original line as a guide, strike a new chalk line on top of the adhesive after it is dry and spread adhesive over the exposed spots.

### 4. Installation

After the adhesive is set, place the first tile squarely into position at the point where the center lines cross. It is very important to lay the first few tile perfectly on the guidelines as they will affect the entire installation. For square or checkerboard designs, one quarter of the room should be laid in a step or fan shape, following the chalk lines struck on the floor. As an example, the tile are numbered as they should be laid (Fig. 62).

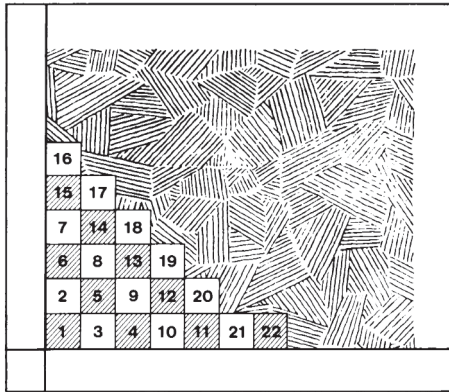


Fig. 62

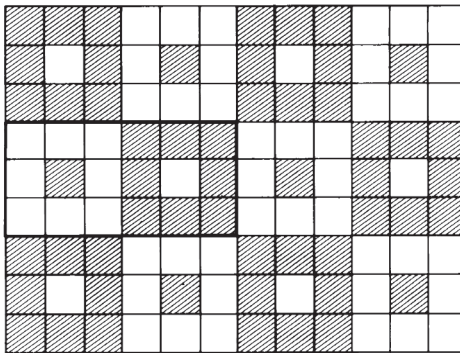


Fig. 63

When repeating a design, adjust the center line so that the full design falls as close as possible to the wall line. It is often helpful to lay the tile designs on the floor dry to see how they are going to work out (Fig. 63). On larger installations of commercial tile, open several boxes of tile at one time and mix them as they are installed. This will help to blend the tile if there is a slight shade difference from one box to the next.

If the subfloor is not completely level, “run-off” may occur. This is evident when the corners of the tile are not meeting exactly. The best way to fix this problem is to leave a tile out to be installed later and continue to install the other tile around the opening. The tile left out must be larger than the opening. Heat this tile from the back and place the corners of the tile into the open space. Lay an unheated tile over the heated tile and apply pressure to compress the heated tile into the opening.

## 5. Fitting

### a. Square Layout

To fit resilient tile to straight walls, place a loose tile “A” over the last full tile in the row. In a “turnblock” design, turn the graining of adjacent tile at a 90° angle. In a checkerboard design, keep the grain running in the same direction. Over the loose tile, place a full tile “B” and butt it against the wall (Fig. 64). Score or mark along the edge of tile “B”, marking tile “A”. Cut along this line with a knife or tile cutter and install tile “A” against the wall. If you will be using wall base or moulding to cover the edges, you can score many tile with a knife and break them along the score line. This does not give a perfectly clean line, but it is adequate if moulding or wall base is installed.

### b. Diagonal Layout

To fit tile along a straight wall in a diagonal design, use a template made of sheet goods, hardboard or metal cut to the diagonal width of the tile being installed. For a diagonal 12 × 12 tile, the measurement is approximately 17 (Fig. 65). Lay the tile to be fit over the last full tile. Use the template to mark where the tile is to be cut (Fig. 66).

### c. Irregular Walls or Door Trims

You can fit irregular walls or door trims by direct scribing. Rough the tile to about 3/4 over the size needed. Place this piece of tile over the last full tile and against the object to be fit, with the excess overlapping the last full tile. Set your dividers to the same distance of the overlap (Fig. 67). This overlap must be consistent across the edge of the tile.

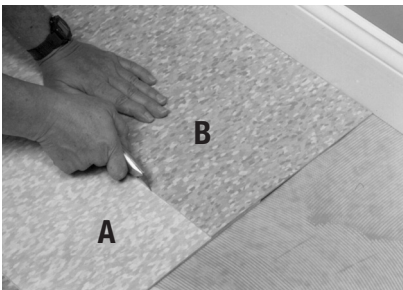


Fig. 64

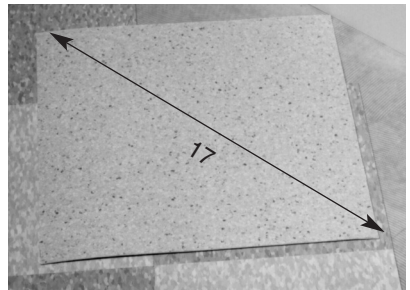


Fig. 65



Fig. 66



Fig. 67

Scribe the tile (Fig. 68). Heat the back of the tile, cut along scribe marks and place it in position. When direct scribing tile for a diagonal layout, draw lines from corner to corner of the field tile to keep the tile squarely aligned (Fig. 69).

#### **d. Pattern Scribing**

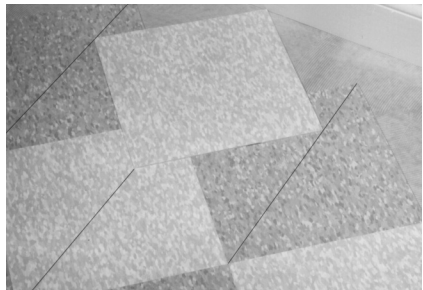
Fitting very difficult areas is sometimes best accomplished by pattern scribing. Cut a piece of scribing felt the exact size of the tile. Place the felt in the area to be fit (Fig. 70). If adhesive is already spread, use two pieces of felt. The first piece will pick up some of the adhesive which could get on the face of the tile when the pattern is transferred. Scribe the felt pattern as described in Chapter VIII, Letter A. Place the pattern over the tile (be sure graining is running in the proper direction) and transfer scribe marks (Fig. 71). Heat the back of the tile, cut along scribe marks and place it in position.

### **6. Finishing the Job**

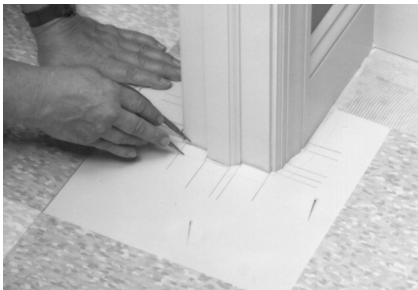
Most resilient commercial tile does not need to be rolled upon completion of the installation. However, residential tile and certain specialty tile must be rolled. See Chapter V, Installation Systems. Do not wash tile for at least 5 days after installation.



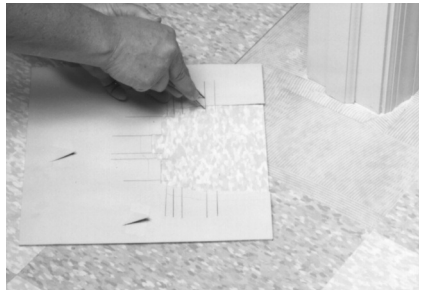
**Fig. 68**



**Fig. 69**



**Fig. 70**



**Fig. 71**