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Layout and Fitting

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A. RESILIENT SHEET FLOORING

There are three general methods of fitting resilient sheet flooring into a room: freehand knifing, direct (or straight) scribing and pattern scribing.

1. Freehand Knifing

a. Precutting and Positioning

In freehand knifing, an oversized piece of material is taken into the room and fit while it is in place. This is the oldest type of fitting and is learned mostly by experience. Safety cuts keep the material from tearing.

Precut the pieces accurately. It is much easier to cut the pieces close to size in an area where you can lay them out flat. Generally, allow 1-1/2" for each end wall.

Move the material into the room. Use special care when handling material wider than 6'. It is easier to unroll rotovinyl flooring if it has first been rolled face-in outside the room. Rolling or tubing material can make it easier to get into the room. If tubed, material should be rolled face-in.

You can often align the factory edge of the material with a straight wall. This saves fitting one wall and can also align the pattern of the material in the room.

b. Safety Cuts

After the material is in the room, make safety cuts so it will lay flat on the floor. This will make final fitting easier and prevent the material from tearing. There are four basic safety cuts: the curved or irregular-shaped wall, the inside corner, the outside corner, and cutting completely around or on three sides of an object such as a toilet bowl or door trim.

The safety cut for an irregular wall is a vertical cut in the part of the material that flashes up the wall (Fig. 1). These cuts allow the material to be pushed down to the juncture of the wall and the floor and take the shape of the wall. They should not go so deep into the material that they show in the finished job. The excess material can then be trimmed away. Place the side of the knife against the wall to guide the cut and to prevent marking the wall.



Fig. 1

The inside corner safety cut is a diagonal cut across the material (Fig. 2) that allows it to be pushed down into the corner (Fig. 3). Do this in steps, checking the fit after each cut so you do not cut too much material from the corner.

Start the outside corner safety cut by pushing the material down to the juncture of the floor and the wall. Cut down along the corner to the floor (Fig. 4). Trim the material flat to the floor at the corner before the ends are pushed down (Fig. 5). Otherwise, a tear may occur at the corner.



Fig. 2

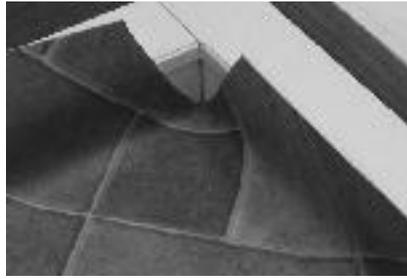


Fig. 3



Fig. 4



Fig. 5



Fig. 6

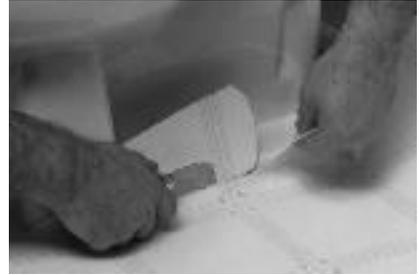


Fig. 7

To cut completely around or on three sides of an object, flash the material up the front of the object and push it in against the juncture of the floor and the object. Slit the material almost to the floor (Fig. 6). You can use a small crosscut at the bottom to keep this cut from tearing into the material. Work the material down to the floor, relieving any strain at pressure points by cutting the material flat to the floor at every place where pressure occurs (Fig. 7).

c. Door Trims

Door trims can be fit by slitting the material down the center of the door trim (Fig. 8), slitting the material to the floor at the pressure points (Fig. 9), and trimming the material to the door casing (Fig. 10). The side of the blade (and not the point) should ride against the trim.



Fig. 8



Fig. 9



Fig. 10



Fig. 11

d. Finish Fitting

After you have made all the safety cuts, pull back the material and spread the adhesive in one half of the room at a time. The adhesive should be under the material and rolled before the final cuts are made. Press the material down into place at the juncture of the objects and the floor. Make small cuts, working the material down to the floor. The spring in the knife blade will help you follow the contour of the object you are fitting (Fig. 11). With the side of the knife placed along the wall, use pressure to bend the blade of the knife so that it follows the object you are fitting. Do not try to cut off too much at one time. Do not exert too much pressure on the point of the knife down into the subfloor.

e. Strip Measuring

This method of fitting is very effective if the wall is straight or if trim or molding is being used. Flash the material up the wall to be fit and pull the material back from the wall. Place a piece of scrap material of the same gauge with a squared end against the wall and under the material (Fig. 12). Then pull the scrap piece back against the material to be fit (Fig. 13). Place a mark at the end of the scrap piece. Remove the scrap and fold the piece back to the point where a straightedge can be laid on the marks (Fig. 14). There should be some additional allowance at the straightedge for the curvature of the material when the marks were made. Mark the material and cut. Be careful not to cut through the material into the flooring beneath.

A wall trimmer can be used for finish fitting of straight walls (Fig. 15). The wall trimmer is a quick and accurate way of fitting straight walls with one pass.

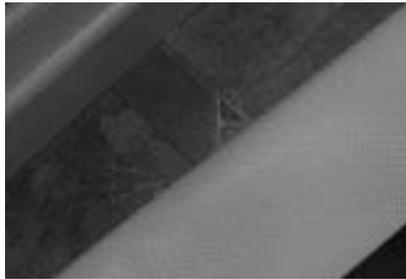


Fig. 12



Fig. 13



Fig. 14



Fig. 15

f. Pattern Matching when Freehand Knifing

After the first piece of material has been fit, spread the adhesive to within 12" of the seam. After deciding the position of the seam in the pattern, cut small key marks using a straightedge (Fig. 16).

Along the proper edge of the second piece, cut small key marks at corresponding places in the pattern. Butt the key marks in the second piece to the key marks in the first piece, leaving the balance of the seam overlapped to be double-cut later (Fig. 17). With the pattern matched, fit and spread adhesive on the second piece to within 12" of the seam. Double-cut the seam (see Chapter 7, C. Seam Cutting), spread adhesive on the area beneath and roll the seam into place.

Many materials that are fit by the freehand knifing method are also seam-coated. Check individual product instructions for information concerning this procedure.

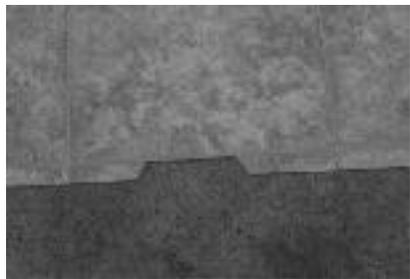


Fig. 16



Fig. 17

2. Direct or Straight Scribing

This type of fitting is used in areas where more than one piece of material is to be installed. With the material moved close to the wall to be fit, use dividers or a scribing bar to move the outline of the wall or object out onto the material. The legs of the dividers or the scribing bar must be held at a right angle to the edge of the material.

a. Three-Wall Scribe

In straight scribing, the usual procedure is to scribe three sides of the sheet, sliding the piece back and forth until it lies flat. This is called a three-wall scribe.

Place the material in the room with both ends flashed up the wall and the length of the piece as close to the wall as possible. Place pencil lines on the wall and the material. Use these lines for proper placement of the cut material (Fig 18).

Using either dividers or the scribing bar, scribe the outline of the main wall onto the material (Fig. 19). The main wall is the one running the length of the piece of the material and is always scribed first. After scribing, move the material away from the wall and cut with a notched knife. This knife will cut cleaner when it is held at a slight angle. Always cut with the scrap piece on the same side as the hand you use to cut the material. This will slightly overcut the wear layer and produce a better fit at the wall.



Fig. 18



Fig. 19

After the piece is cut, move it into place against the main wall with the ends flashed up. Line up the pencil lines (made in Fig. 18). Draw a line along the factory edge of the material when it is in place against the main wall (Fig. 20). This will keep the factory edge parallel to the wall when it is pulled back to scribe the end wall. Without this line, the material could become turned, causing an inaccurate scribe on the end wall. If you keep the factory edge on this line when it is pulled back from the end walls, the pieces will always be straight in the room. Draw a crossline on the material and on the subfloor at the factory edge (Fig. 21). These two lines should line up when the piece is in place. Pull the piece of material away from the end wall until it lies flat.

With the factory edge on the line drawn along it, set the dividers to the difference between the two crosslines (Fig. 22). Scribe this amount from the end wall. Reverse the procedure for the other end wall using the same set of lines as those used for the first wall.



Fig. 20

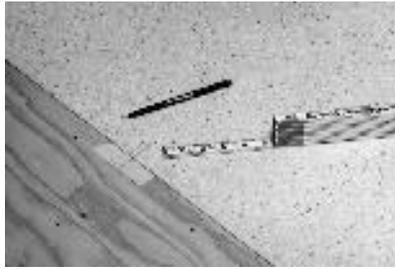


Fig. 21



Fig. 22

b. Pipes

When scribing a wall and a pipe at the same time, use offset lines for the sides of the pipe (Fig. 23). Extend these lines straight out from the sides of the pipe and squared to the edge of the material. Use the same scribe setting as the one for the wall and mark the front of the pipe between the offset lines. Swing a circle with the dividers, touching both offset lines and the scribe mark (Fig. 24). Cut a seam to the circle, and cut out the scribe line for the wall and a circle for the pipe (Fig. 25).



Fig. 23



Fig. 24



Fig. 25

c. Door Trims

Offset lines are also drawn on the material when scribing door trims (Fig. 26).

A rough scribe can be used where the scribe is too long to be accurate (Fig. 27). After the rough scribe with the scribing bar, move the material closer and rescribe using the dividers for a more accurate fit (Fig. 28).



Fig. 26



Fig. 27



Fig. 28

3. Pattern Scribing

Pattern scribing is a method of fitting material in small or complicated areas. Using scribing felt or some other paper, the outlines of the room and the objects in it are moved a certain distance onto the felt paper. When this pattern is placed over the material to be installed, the lines are moved back the same distance.

a. Knifing in the Felt

Cut the felt paper into the room using a straight-blade knife. It is not necessary to cut the paper very close to all the objects, but it should be within 1/4". If more than one piece of felt is used, butt the edges together. If the felt is bowed so that a butt seam cannot be achieved, overlap the two pieces and double-cut a seam. After all the pieces are cut into place, cut triangular windows and secure with tape. Crosslines should also be scribed across the seams (Fig. 29). This will help in lining up the two pieces when they are moved to another area to transfer the scribe lines.



Fig. 29

b. Scribing the Pattern

The same tools and settings must be used to transfer the scribe lines onto the material that were used to scribe them onto the felt. To insure this, put the setting of your dividers on the felt before you scribe (Fig. 30). Check this setting before the pattern is transferred.

After the felt is in place, scribe the pattern with dividers or a straightedge. Using the dividers and keeping the legs at right angles to the point you are scribing, move the outline of the walls onto the felt (Fig. 31). On straight walls, you can also use a straightedge or square (Fig. 32).

When you come to a door trim or some other offset, extend lines for all surfaces running parallel to the legs of the dividers (Fig. 33). These lines will later be extended from the pattern onto the material. Mark pipes by using a rule to move the sides of the pipes out onto the felt (Fig. 34).

When this is done on four sides of the pipe, there will be a square on the felt. When this felt pattern is placed over the material and these lines are moved back the width of the rule (Fig. 35), there will be a square on the material. Using dividers, swing a circle hitting all four sides of the square. The pipe will fit into that circle.

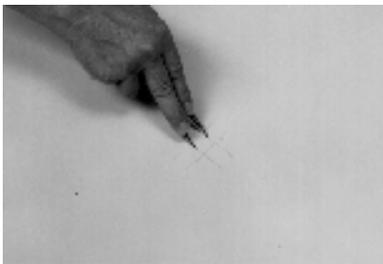


Fig. 30



Fig. 31



Fig. 32



Fig. 33



Fig. 34



Fig. 35

c. Transferring the Pattern

Now that the lines of all objects in the room have been extended onto the felt pattern, lay out the material to be fit in a larger area that is clean, well-lighted and warm: a family room, garage, basement, etc. It is not a good idea to take the material outside unless it is a covered area which meets the proper temperature requirements. Driveways have stones that can punch holes in the material, and sometimes tar or asphalt can discolor it. Place the felt pattern over the material so that it is lying exactly as it was in the room.

The felt pattern must be aligned with the pattern in the material so that the longest wall will be parallel to the pattern in the material.

The crosslines you put across the seam will help you to line up the pieces of the pattern. Fasten the felt pattern to the material with tape at the triangular windows so it will not move. Extend all of the lines from the felt pattern onto the material the same distance you extended them onto the felt pattern.

Fig. 36 shows the lines being transferred with the dividers, and Fig. 37 shows the lines that were put on with the square being transferred.

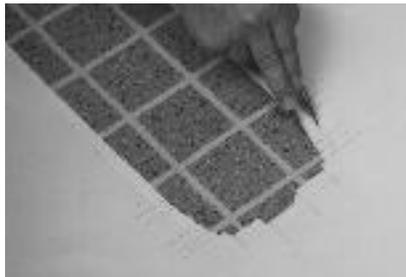


Fig. 36



Fig. 37

d. Cutting the Pattern

After you have moved all of the lines from the felt pattern to the material, you are ready to cut the material on your scribe or pencil lines. We recommend a notched-blade knife, which cuts through the material in one cut and does not cut the floor beneath (Fig. 38). Keep this in mind when you are selecting an area in the house for your pattern scribing. A good floor could be ruined if you cut into the floor beneath your material.

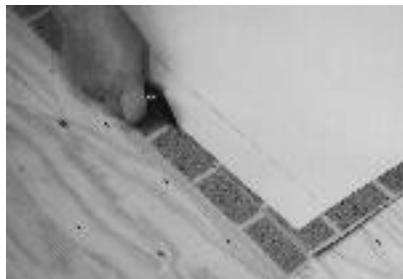


Fig. 38

e. Pattern Matching when Pattern Scribing

If the first piece of material is fit and adhered in place and the second piece must be pattern scribed, straightedge the first piece at the seam edge at the proper place in the pattern of the material. If the material has a grout line along the edge, reduce it to a width slightly smaller than those grout lines in the field of the material. This will allow the material to be seamed along the edge of the grout line. Cut the felt, butting it to the straight edge of the first piece of material and scribe the room as usual. Mark the pattern of the installed piece on the felt so you can place the felt over the second piece of material on corresponding pattern lines. There are two ways to do this:

1) Extend pattern lines from the first piece of material onto the felt (Fig. 39). These lines can be used to place the felt over the same lines on the second piece of material and allow you to line up the pattern along the length of the material. Make an allowance to get the proper overlap of the second piece over the first piece when installed. This is necessary to allow some selvage to cut the seam and also to cut away enough material on the second piece to provide a proper match. Cut small key marks in the felt along the straightedged piece using a folding rule or bar if the felt does not butt very well to the edge of the material (Fig. 40). Use these key marks to locate the area in which the seam is to be cut. You can use the edge of the felt for this purpose if it butts well to the straight edge of the first piece of material. When the felt is assembled over the material, use the lines and key marks to align the match and the overlap (Fig. 41).

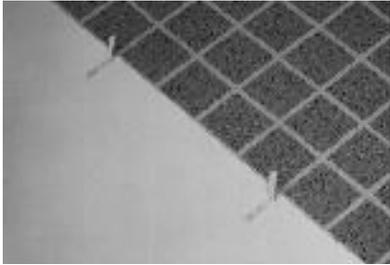


Fig. 39



Fig. 40

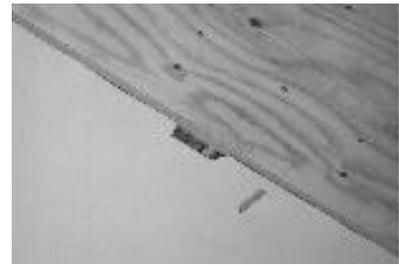


Fig. 41

2) Use a scrap piece of material to mark the match on the felt. Cut a scrap piece from the selvage that was left when the first piece of material was fit to the wall. It should correspond to the edge of the second piece of material that will be at the seam. Place this piece of material over the felt so that it matches the first piece of material that has been installed (Fig. 42). Cut the outline of this piece of material into the felt (Fig. 43). Mark several areas along the seam. When the felt has been scribed, place the scrap template over the second piece of material so it is over the exact match (Fig. 44). Bring the felt pattern in against the scrap template until the cutout area fits around the template (Fig. 45). This should line up the end-to-end match and the overlap.

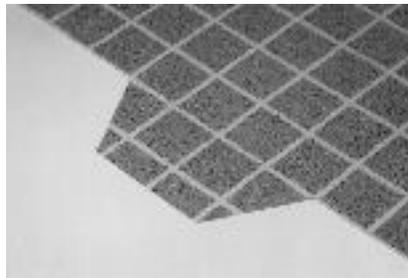


Fig. 42



Fig. 43

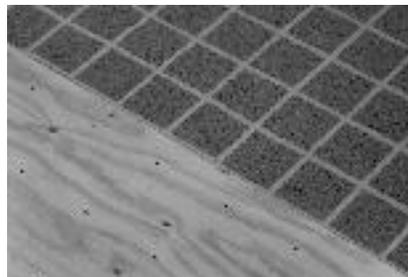


Fig. 44

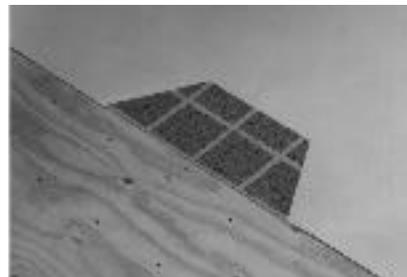


Fig. 45

f. Pattern Matching by Scribing Two Pieces at One Time

The easiest way to pattern match while pattern scribing is to lay out more than one piece at a time. The limiting factor is having enough room to lay out both pieces of material. Straightedge one piece of material for the seam and overlap the second piece to line up the pattern match. Tape the two pieces securely together. You can pattern scribe the complete room and place the felt pattern over the two pieces of material. Be sure the felt pattern is squared with the pattern of the material. Transfer the felt pattern to the material and cut it out. When the material is placed in the room, the seam area will match. You will be ready to cut the seam after you spread the adhesive.

B. RESILIENT TILE

1. Square Layout

Methods for laying out the room are the same for all kinds of resilient tile. 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.

If the room is rectangular with practically parallel walls on all sides, find the center. For instance, in Fig. 46, wall WX is 20', wall YZ is 19' 11", wall XZ is 30', and wall WY is 30' 1-1/2".

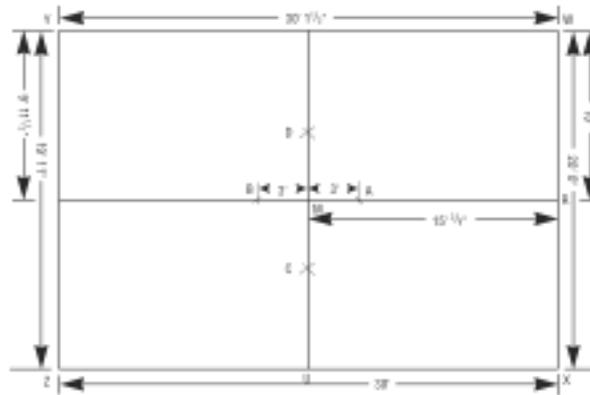


Fig. 46

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.

Find M, which is the midpoint of line RS. At M, strike 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 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 and B. These lines will act as reference points to make arcs C and D.
- With A as a center point, construct an arc any distance greater than the distance between A and 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 and B will cross each other at points C and D. Through points C, D and M, strike 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. 47. Point M is found midway between R1 and S1. 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" x 12" tile laid in a room 15' 4" x 20' 8" (Fig. 48).

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" x 12" tiles 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" x 8". At walls A and B, the last row of tile must be cut to 12" x 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 48).

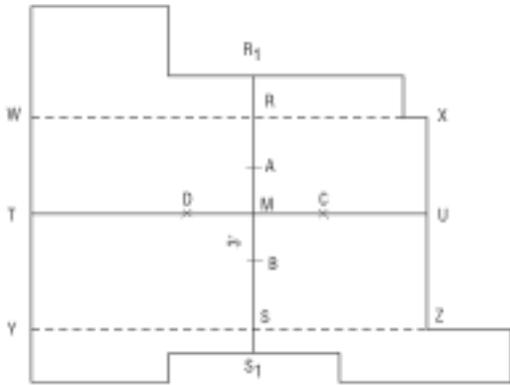


Fig. 47

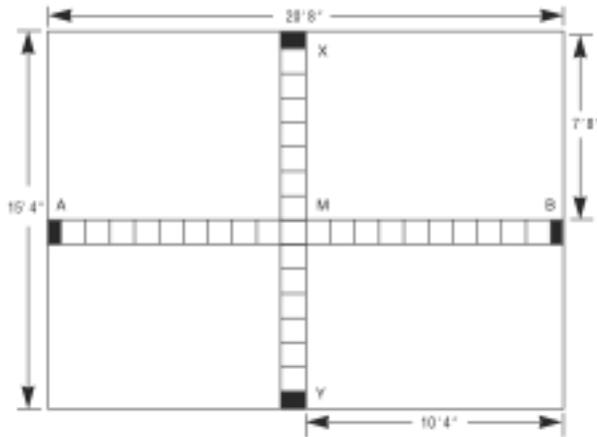


Fig. 48

The adjustment is to move line XY. Another chalk line is struck parallel with XY but 6" (one half of the width of a 12" x 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" x 10". This new line is X1Y1. Eliminate the old center line XY (Fig. 49).

The row starting at the new center M1 and running along line M1X1 will include seven full 12" x 12" tile plus one tile that must be cut to 12" x 8". Line M1B will include nine full tiles plus one tile that must be cut to 12" x 10". The 12" x 10" tiles along walls A and B balance with the 12" x 8" tiles 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, center line AB could have been adjusted in the same manner.

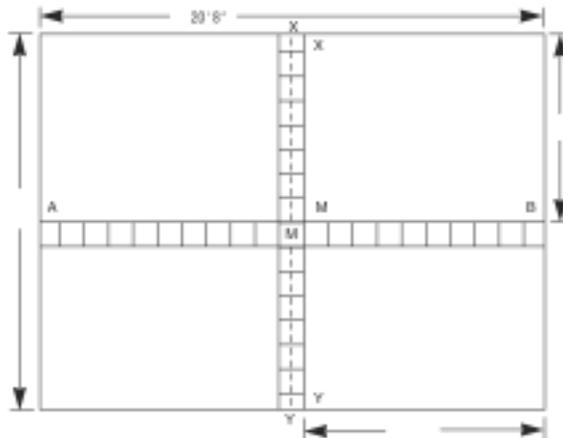


Fig. 49

2. Diagonal Layout

For diagonal layouts, square off the room and strike center lines as for square layouts. Set up diagonal lines (Fig. 50). 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 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 extended chalk line WX through GMH to the walls. To find the number of tiles across the room, lay a row of tiles dry-point to point along each center line (Fig. 51).

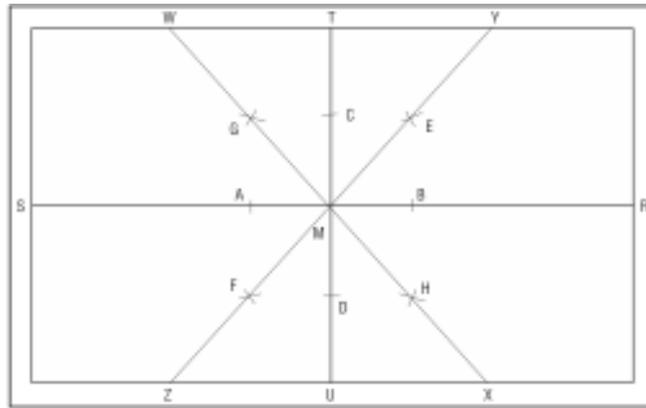


Fig. 50

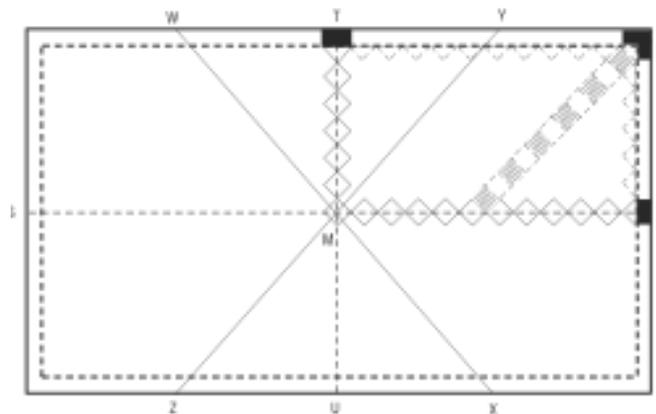


Fig. 51

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

When a design is properly laid on the diagonal, all half tiles at the border or wall line should be of one color and a quarter tile should be used in each corner (Fig. 52). When using two or more colors of resilient tile in diagonal designs, the graining of the half tiles at the border should run in the same direction as the graining of the corresponding color of full tiles (Fig. 53). Two types of half tiles are required. They are known as the right half tile and the left half tile. In right half tiles, the grain runs up to the right from the longest side of the half tile. In left half tiles, 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 tiles are cut on a diagonal from the lower left corner to the upper right corner and left half tiles are cut on a diagonal from the upper left corner to the 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 tiles on midpoint M to obtain half tiles of the same color along walls T and R and a quarter tile in the corner (Fig. 54). To change the color of the half tiles in this case, reverse the colors of the four tiles at the center.

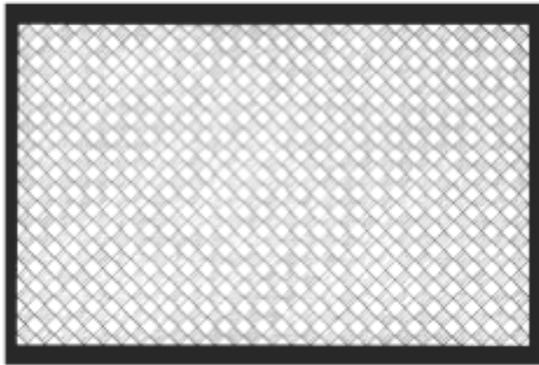


Fig. 52

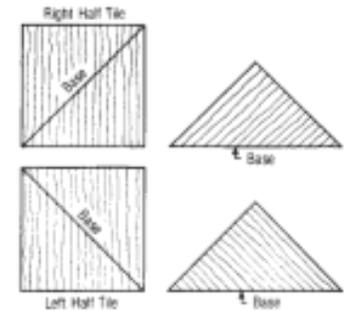
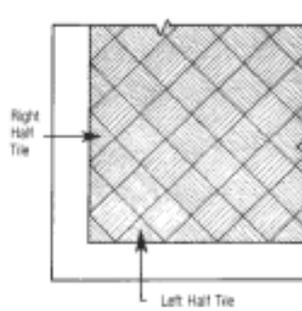


Fig. 53

Fig. 55 is an example of a diagonal design laid out incorrectly. Although the border width is in proportion for the room, the half tiles along the border at wall R are black, and the half tiles 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 tiles on the center line (Fig. 54).

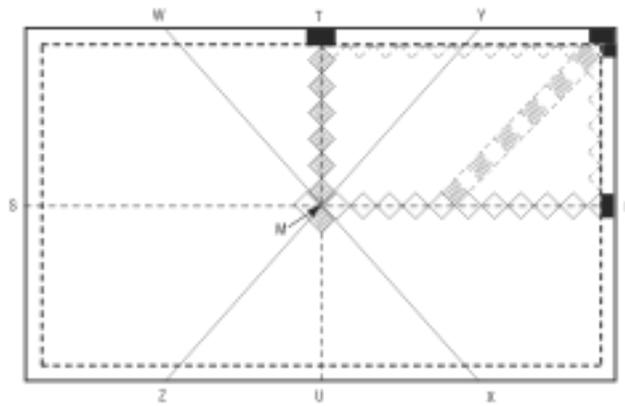


Fig. 54

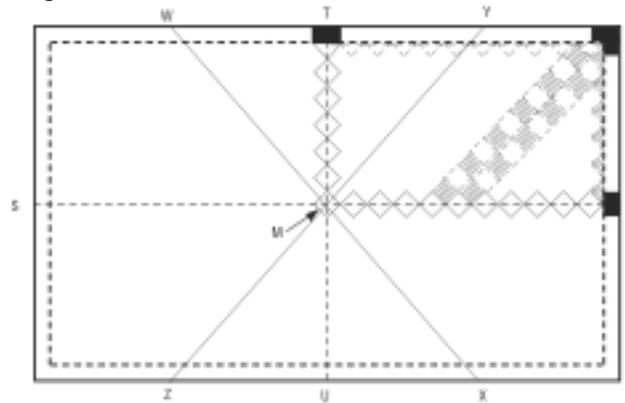


Fig. 55

If dry fitting the tile shows the center tile should be placed squarely over midpoint M for proper border width (Fig. 51), it will be necessary to set up diagonals W1X1 and Y1Z1. Mark diagonal lines W1X1 and Y1Z1 half the width of a tile away from, and parallel to, the diagonal lines WX and YZ (Fig. 56).

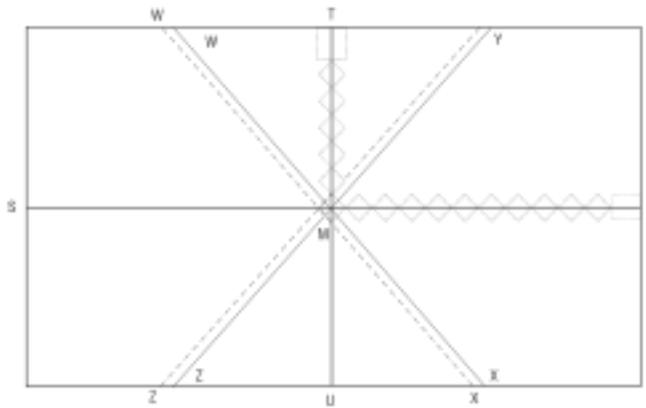


Fig. 56

After locating the diagonals, spread adhesive and install tiles following the diagonal center lines (Fig. 57). Using the starting point established after dry fitting, fit the center tile into position at the junction of lines WX and YZ or W1X1 and Y1Z1. Lay diagonal designs with the first row fit along the diagonal center lines of the layout.

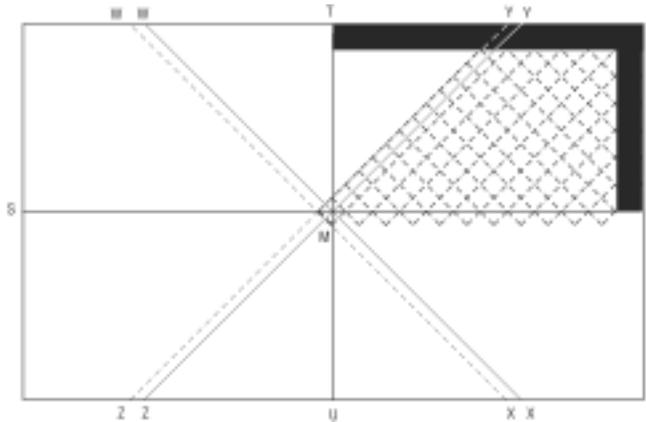


Fig. 57

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 tiles 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 tiles are numbered as they should be laid (Fig. 58).

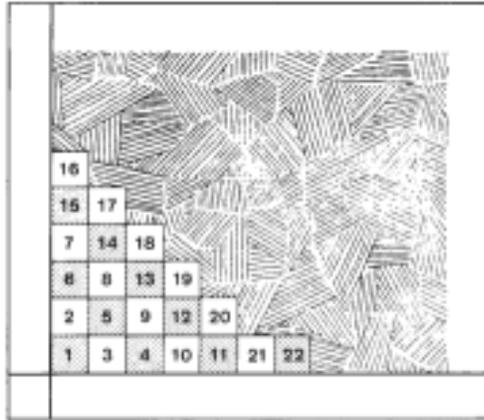


Fig. 58

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 design on the floor dry to see how it is going to work out (Fig. 59). 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 tiles if there is a slight shade difference from one box to the next.

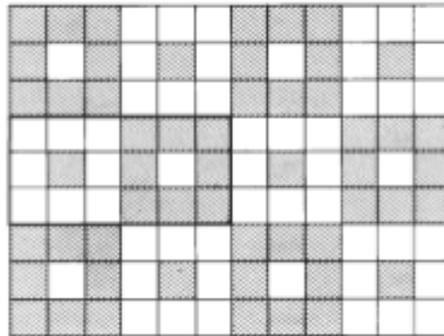


Fig. 59

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 loose tile A over the last full tile in the row. In a “turnblock” design, turn the grain of the adjacent tile at a 90° angle. In a checkerboard design, keep the grain running in the same direction. Over the loose tile, place full tile B and butt it against the wall (Fig. 60). 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 molding to cover the edges, you can score many tiles with a knife and break them along the score line. This does not give a perfectly clean line, but it is adequate if molding or wall base is installed.



Fig. 60

b. Diagonal Layout

To fit tiles 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" x 12" tile, the measurement is approximately 17" (Fig. 61). Lay the tile to be fit over the last full tile. Use the template to mark where the tile is to be cut (Fig. 62).

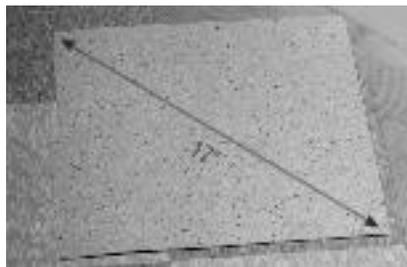


Fig. 61



Fig. 62

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. 63). This overlap must be consistent across the edge of the tile. Scribe the tile (Fig. 64). Heat the back of the tile, cut along scribe marks and place it in position. When direct scribing tiles for a diagonal layout, draw lines from corner to corner of the field tile to keep the tile squarely aligned (Fig. 65).



Fig. 63



Fig. 64



Fig. 65

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. 66). 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 7, A, Pattern Matching. Place the pattern over the tile (be sure the grain is running in the proper direction) and transfer the scribe marks (Fig. 67). Heat the back of the tile, cut along scribe marks, and place tile in position.



Fig. 66

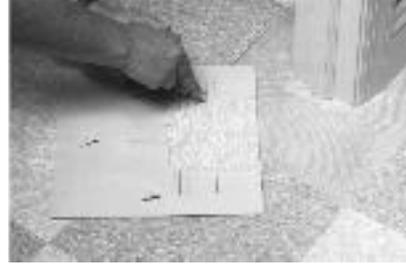


Fig. 67

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 4, Installation Systems. Do not wash tile for at least 5 days after installation.