Installing a Sheet-Vinyl Floor

Whether flat-lay or coved, use a felt-paper pattern for best results

by Terry Shrode

People still call it linoleum, even though it isn't, and the chances are good that the floors in your bathroom and kitchen are covered with it. It's properly called resilient flooring, and it also turns up in the family room, workshop and utility porch—any place where a durable, low-maintenance and affordable floor is a requirement.

Resilient flooring is available in a wide price range, from as little as $3 a square yard to over $30 a yard, and it comes in colors and designs that will suit just about anybody's taste. Along with the outlay for supplies, you can figure an equal amount for the installation labor. This article is about how to install resilient flooring in two different ways. One is the relatively easy flat-lay method. The other is the more complicated coved style that used to be common with linoleum floors.

Flat-lay is the term for a floor that meets the wall at a 90° angle. This junction is covered by a baseboard or a toe molding. A coved floor requires a little more material than a flat-lay floor, and it wraps right up the wall, where it is finished with a J-section trim piece called cap metal (drawing, facing page). The floor-to-wall intersection is backed with radiused blocking called cove stick. At inside and outside corners, the flooring is mitered—it's the floor mechanic's version of the carpenter's crown-molding problem. A coved floor is more difficult to install than a flat-lay floor, but I think it looks classier, and it's easier to keep clean at the perimeter.

There are two basic types of resilient floors available today (sidebar, facing page): sheet goods, which come in 6-ft., 9-ft., 12-ft. and 15-ft. widths; and tiles, which are usually 1-ft. square. Most sheet goods and tiles are made of either vinyl compositions or pure vinyl. I'm going to concentrate on sheet vinyl because it's the most popular, and it comes in the greatest variety of colors, grades and designs.

Vinyl-tile floors follow the same basic installation procedures as sheet-vinyl floors, and the boxes of tile usually include easy-to-follow instructions. But I think vinyl-tile floors have one serious drawback: they have lots of seams for water or dirt to invade. This can be a serious problem, especially in wet locations with wood subfloors. Don't get me wrong—I've seen properly maintained inexpensive vinyl-tile floors over wood substrates that have lasted for many years, but this is the exception and not the usual case.

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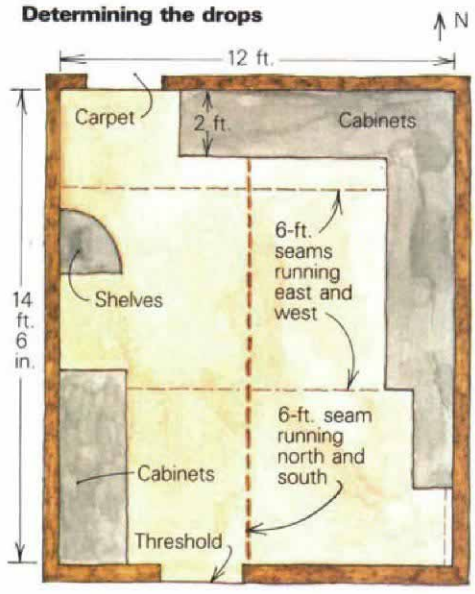
Estimating materials—The rule of thumb is to lay out the floor with the fewest seams, and with the least amount of waste. There are only two possible directions to run the vinyl, and one is usually better than the other.

In the kitchen plan below, I've shown the layout lines for an installation using 6-ft. wide goods (the most common width available) running the two possible directions. The east-west direction leaves me with both more waste and more seams than the other option, so the north-south orientation is clearly the best choice here. Two pieces, or drops, are needed for this floor. The west-side drop is 14 ft. 6 in. plus an extra 3 in. that should be added to any length to allow for trimming. This floor will be coved, which requires about 4 in. of material per wall, thereby adding another 8 in., for a total of 15 ft. 5 in. If the plan calls for doorways to be covered, this will add to your total—be sure to include them.

The east-side drop is 2 ft. shorter, because of the cabinets, for a sum of 13 ft. 5 in. The tiny gap in the southeast corner will be filled with a piece of scrap from the cabinet cutouts.

The total amount of material you need to order depends on the "pattern match" for the particular piece of flooring in question. If the piece has no definite design, no extra material is needed. If, on the other hand, there is a recurring design, the distance between repetitions has to be added to each drop after the first one. The design in the material chosen for this kitchen repeats itself every 18 in., so the east-side drop totals 14 ft. 11 in. If there were a third drop, it too would need another 18 in. added to it, and so on. The grand total for this kitchen is 15 ft. 5 in. plus 14 ft. 11 in. With 6-ft. goods, this comes out to **20¼** sq. yd.

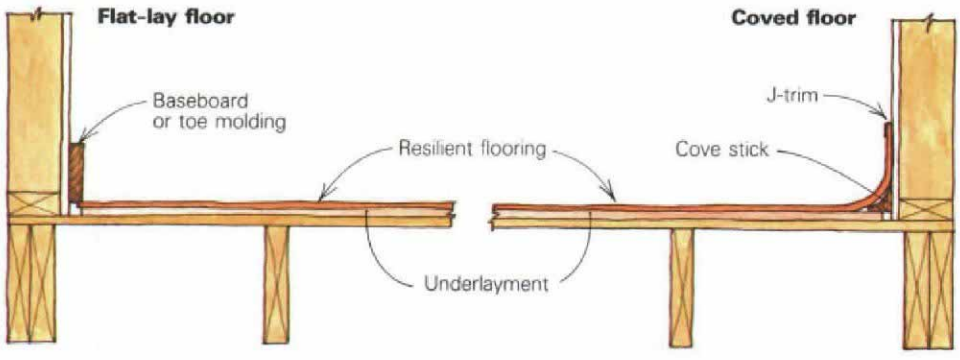


Subfloor—It often takes more time to prepare the base under the sheet goods than it takes to install the new flooring, and this is one of the most important steps in the entire process. Every ridge, bump or gouge will telegraph through the new floor, inviting premature wearout. Termite and water damage are the other big problems, and you should take care of any major structural upgrades before you begin work on the new floor. Check to see that the existing floor is securely fastened to its joists. Eliminate squeaky spots or loose floorboards with a few ringshank nails.

A lot of the floors that I install are over existing vinyl or linoleum surfaces. They are adequate subfloors if they are free of wax or grease. I cut back any small imperfections, such as loose seams, gouges or bumps, to solid underlayment, and fill the resulting gaps with a patching compound like Fixall (Dowman Products, Inc., Box 2857, Long Beach, Calif. 90801).

A floor with more extensive damage should be covered with ⅜-in. or thicker plywood or particleboard. This includes old T&G floors that have cupped or twisted. Install the plywood finished side up; if you use particleboard, get the best underlayment grade you can find. Where I work on the West Coast, we don't have the wide humidity swings that are common in other parts of the country. Consequently, I leave about a 3/16-in. gap at the walls, but I don't leave much of an expansion gap between the sheets. I just loosely butt them together in a staggered pattern and secure them to the subfloor with ⅞-in. staples. I use staples because they are fast, and because they don't leave dimples in the underlayment the way nails might. If you choose nails, make sure they are ringshanks. Don't use sheetrock nails—they will work their way out over time. In either case, nails or staples should reach ½ in. into the subfloor, and they should be

Two 3-ft. wide pieces of builder's felt are butted together and taped to make a pattern for the first drop in the kitchen shown in the drawing on the facing page. Here the finished pattern has been taped onto the flooring, and Shrode is trimming the material to fit. The corner cut-out at the bottom of the photo indicates that this will be a coved floor.



Illustrations: Frances Ashforth

Resilient flooring

A hundred years ago, an Englishman named Walton coined the word linoleum to describe a pliable floor covering made of wood pulp, cork, turpentine, pigments and oxidized linseed oil. This mixture was applied to a burlap or canvas backing, and it was ready to install. Linoleum is still an excellent floor covering, but it requires lots of maintenance and is now made only by the Krommenie Co. in Holland and distributed by the L. D. Brinkman Co. (14425 Clark Ave., Industry, Calif. 91745). People also use it for countertops and drafting boards.

Today's resilient flooring also includes cork and rubber-base products. But by far the most common are vinyl floor coverings. Vinyls are petroleum-base plastics that are made into floor coverings in two basic ways.

The first is the inlaid method, which produces hard-surface goods. Millions of tiny vinyl bits, with color built right into them, are spread out and compressed at high temperature into a thin layer, which is then bonded to a backing material for strength. Inlaid floors are very durable because the color runs deep into the material. They also have a very hard surface and they are quite stiff, which makes them difficult to install.

Rotogravure is the second method. Rotogravure floors make up the bulk of the sheet-goods business, and the cushion layer built into them makes them comfortable to walk on and resistant to dings. To produce them, rolls of blank flooring are run through printing presses. A plate on the press carries the photographic image of the design, which is embossed into the flooring. A thin layer of vinyl above the cushioned core then receives colored dyes from the press to complete the design. A clear layer on top takes the wear.

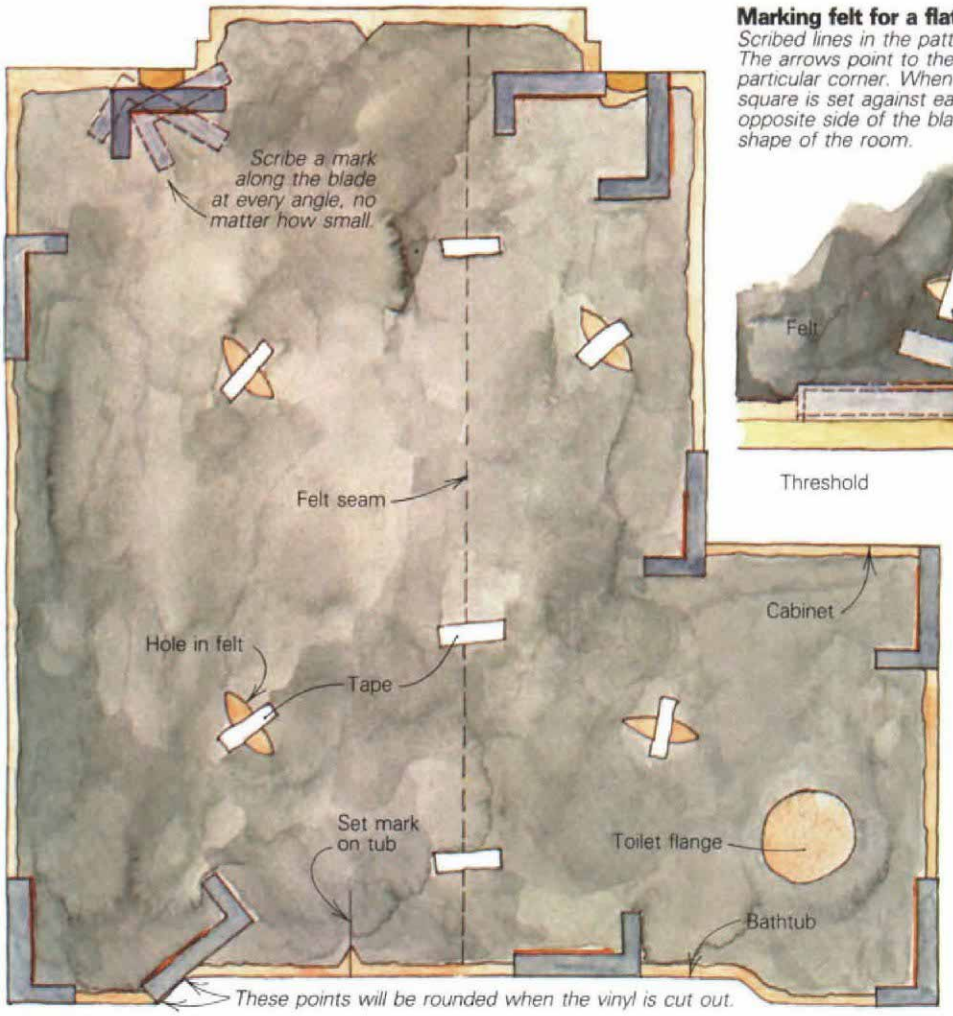
Once they are installed, cushioned floors have to be sealed at their seams with a special solvent made for each type. It comes in applicator bottles from your supplier, and it welds the two pieces of flooring together to keep out dirt and moisture.

Both inlaid and rotogravure vinyl floorings are available in what manufacturers call wax or no-wax finishes. No-wax means the floor looks waxed, but you don't have to wax it. Wax means you have to wax it. In the past, I avoided cushioned floors with no-wax finishes. They had a thin layer of PVC over the flooring and didn't wear very well. But recently, the manufacturers have come out with new coatings that seem much more durable.

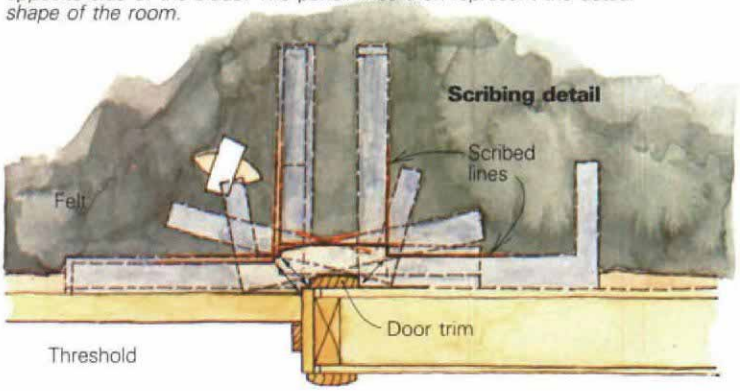
Another change is in the backing material. For years, asbestos backing was the standard. It resisted heat, moisture damage and mildew, but as we now know, is an awesome health hazard. The industry still hasn't settled on its replacement. Some floorings now have vinyl backings, which are an added expense. Others have a fiberglass backing, which can leave you scratching at the end of the day when you install it. But both of these are improvements over asbestos.

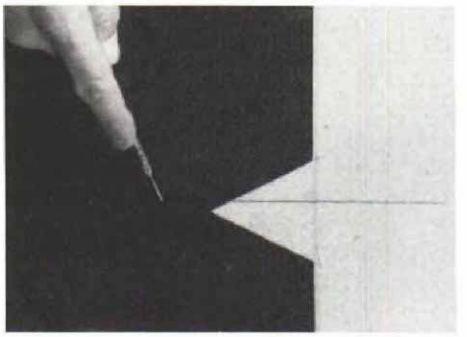
In the vinyl-flooring business, new products are being introduced all the time, some of which require new installation procedures. Some call for different adhesives, others shouldn't be back-rolled during installation. It's important to ask your supplier about the specific procedures to follow for your floor.

In general, you get what you pay for in resilient flooring, but after a point your money is spent on style rather than durability. Around here, $20 per yard will buy you a floor that should last for 20 years. Check with your local flooring contractor for the brands and styles that are available. And try this test for durability when you're shopping for a vinyl floor: Scratch the surface of the floor sample with your fingernail. If you can gouge a hole, or come close to it, stay away from it. —*T. S.*



Marking felt for a flat-lay floor
Scribed lines in the pattern felt store the shapes of the walls' contours. The arrows point to the corresponding intersections of lines that mark a particular corner. When the felt is placed over the flooring material, the square is set against each scribe mark, and a pencil line drawn on the opposite side of the blade. The pencil lines then represent the actual shape of the room.





A set mark registers a scribed line in the pattern to a pencil line on the subfloor or wall. Once the pattern is on the flooring, the scribed line will be continued with a pencil mark so that the flooring will line up with the appropriate point in the room.

spaced ½ in. from the seams 3 in. o. c. around the edges and 8 in. o. c. in the field.

Adding a new floor over two or three layers of old flooring is fine. Before you do this, though, check for height problems. Building up the floor this way will sometimes trap the dishwasher or prevent the refrigerator from fitting back into its nook. You may have to remove the old floors. If the old surface is a cushioned-type resilient floor, don't install hard surface goods over it—foot traffic may crack the new material. If the old floor is smooth, you can lay the new one right over it, without new underlayment. Be sure to give it a thorough cleaning with TSP (tri-sodium phosphate) so that the adhesive will stick. Don't sand the old flooring—it might have asbestos in it. If it's a coved floor, cut out the portion that wraps up the wall and remove the old J-trim, but leave the old cove stick. It will work fine for the new floor.

Making a flat-lay pattern—There is nothing mysterious about laying a vinyl floor, even with coving. The key to success is the pattern. The pattern is made of felt paper (15-lb. builder's felt is fine) pieced together with duct tape or masking tape to approximate the shape of the floor. In a room where it takes only one piece of material to cover the floor, I make a pattern (drawing, above left). It begins with a piece of felt butted against the longest wall, followed by consecutive pieces until the floor is covered.

If the floor is to have more than one drop, I strike a chalkline to mark the first seam. The placement of this line is critical, because the rest of the floor will be affected by its position. When I'm using 6-ft. goods in an area with more than one drop, I use two 3-ft. wide lengths of felt butted together to simulate each drop. One edge of the pattern corresponds with the seam in the vinyl. In either case, I cut eye holes out of the pattern so I can tape it to the work, and I avoid creasing the felt.

Once the pattern paper is secured to the floor, I make set marks, registration points that I mark with a scribed line on the pattern and a pencil line on the underlayment, tub edge or wall (photo above). I notch the pattern with a V at these points to make them easy to find. I like to use at least two set marks for each drop—usually one along the length and one along the width. These marks will later be transferred to the vinyl flooring.

The pattern is cut about an inch shy of the walls all around. This allows me to transfer the shape of the room onto the pattern. I do this with a square with a 12-in. long blade that is 1½ in. wide. The blade spans the gap between the pattern and the wall, and I make a scratch on the room side of the blade (drawing, above right). Then I work my way around the room, marking every angle, no matter how small, with a scratch on the pattern paper. I make the marks at least 4 in. long. If I have to use the square's short leg, which is 1 in. wide, I make a note on the pattern to remind myself that something out of the ordinary was done. Later, when I use the pattern to mark the correct perimeter on the actual goods, I just reverse this whole process.

I mark curves by moving the square around them at short intervals. These marks will later be connected and rounded off when the material is cut. These scribe marks can look like unintelligible scratches at first, especially around door casings and pipes. Study the drawings to see how the scribe marks capture the room's contours.

Trimming the seams—If the floor will have a seam, the material has to be trimmed. Factory edges must never be used for seams. They will be crooked, gouged or dirty, and all vinyl sheet goods are slightly oversize to allow for trimming.

Sheet goods are installed with reversed seams, unless the manufacturer says otherwise. This means that a roll of sheet goods has a left edge and a right edge. Installed, a right edge butts against a right edge, and a left edge butts against a left edge. Therefore the drops will alternate in direction. I cut the pieces individually, then butt them together at the seam because I've found this to be the

quickest and most accurate way for me. Others cut both layers at once.

Roll the flooring out, face up, on a clean, smooth surface. Garage floors are nice if they aren't oily. Don't lay the material in direct sunlight, which will cause it to shrink. Now back-roll the flooring, and roll it out flat again. This also shrinks the material, but since you have to back-roll it during installation, you want the shrinkage to take place before the material is cut.

Where to cut the seam depends on the design of the floor. If it has one with straight lines, they will have a certain width—usually ⅛ in. to ½ in.—to simulate grout lines. Trim to one side or the other; if you leave the line on the first drop, cut it off the next drop. Some floors have extra-wide grout lines at the edges. They have to be trimmed down to match the grout lines in the rest of the design. If the material has no design, take off about ½ in.

Position a long straightedge at the appropriate spot along the border of the material. Kneel on one end, and steady the other end with your hand (photo above left). Use a utility knife with a fresh blade to score the surface. The hand will naturally make a bevel, so turn the knife inward slightly to make sure the blade follows the straightedge. Make a smooth cut approximately 2 or 3 ft. long—whatever length is most comfortable for you. Stop, but don't remove the knife. Slide your hand and knee down the straightedge and repeat the cut. When you get to the end of the straightedge, don't remove the knife. Just slide the straightedge down the border, line it up, and keep cutting.

Use the linoleum knife to finish the seam (photo above right). Place the curved part of the blade in the groove made by the utility knife. Pull gently, letting the knife follow the score mark.

Sheet goods are made extra wide and have to be trimmed at the seams. The author prefers to cut one sheet at a time, using a long straightedge and a utility knife to score the vinyl, left. The cut is finished with a linoleum knife, above.

Shrode uses notches cut in the pattern felt to register the second drop to the first. The notches are placed three design repetitions apart, and let him accurately position the pattern on the material.

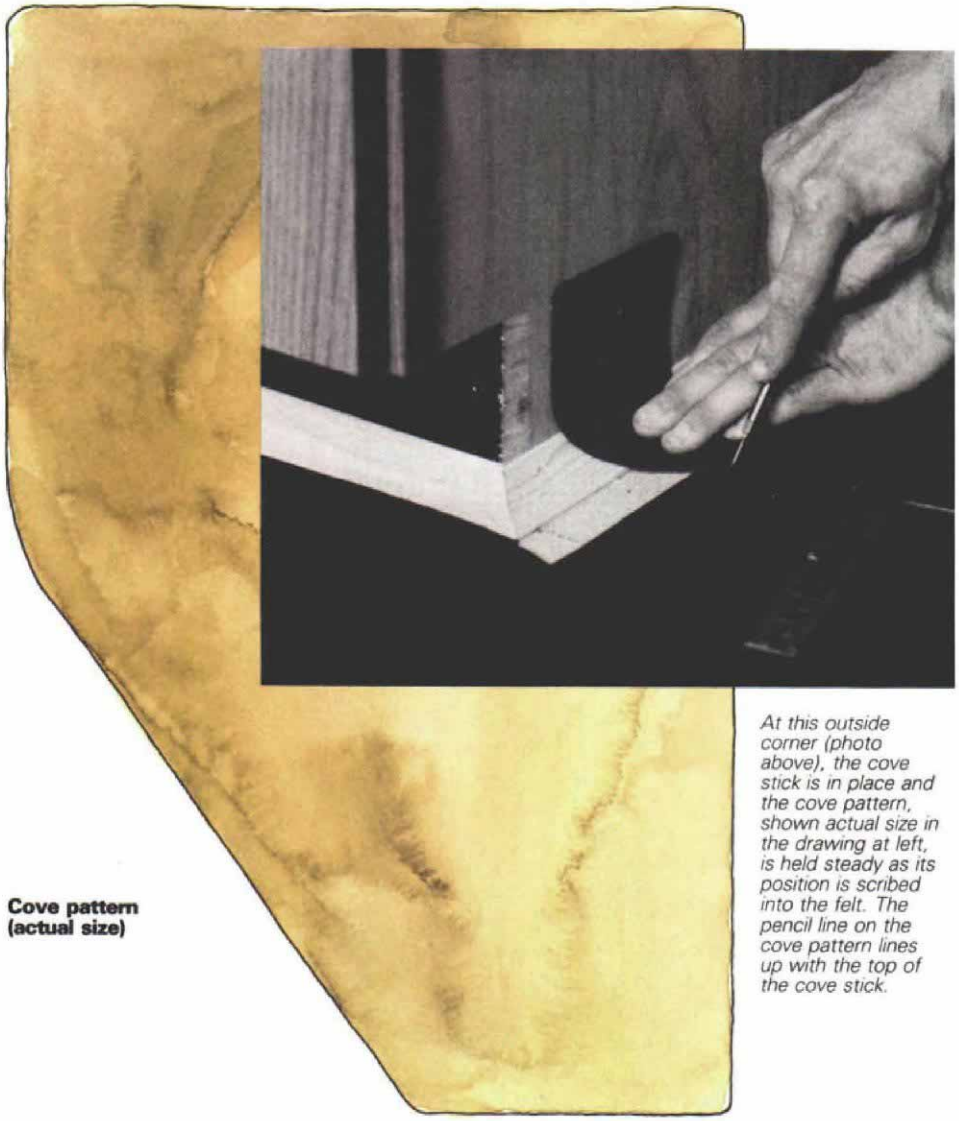
Using the pattern—Align the pattern felt along the edge of the seam, and adjust it so that the design in the vinyl breaks the same way at each end. If the pattern felt covers the entire floor, adjust it to be as square to the design in the flooring as possible, with equal design breaks around the edges. This is usually a matter of compromises, since four walls are rarely square. Using the eye holes in the felt, tape the pattern to the material.

Now transfer the marks on the felt to the flooring. Place the square next to each mark, and make a pencil line on the opposite side of the square onto the material. When you're finished, you have a picture of the floor. Using the utility knife, cut on the waste side of the pencil line. This will make the material a little fat and ensure a tight fit. Round off the corners slightly, and be careful not to cut into the main sheet. For long, straight runs, use the straightedge. Take your time.

Installation—Sweep the floor clean, back-roll the vinyl again to make it easy to carry, and lay it in place to check the fit. Trim any areas that need it, and make sure the set marks are telling the truth. Remove the flooring, and use a 3/32-in. notched trowel to spread latex adhesive over the area of the first drop. Stop the adhesive 3 in. shy of the seam line. This area will be spread with adhesive when the second drop goes down. Make sure there are no puddles in the adhesive, and set the flooring into it while it's still wet. One person can do this, but it's a lot easier with two. Position the areas with the set marks first, spread the floor out and use a moist rag to pick up excess adhesive. Immediately use a floor roller, which you can rent, to squeeze the material down into the adhesive. Work from the center toward the edges. After rolling, a few bubbles may persist. They should disappear by morning, because the latex draws the flooring downward as it dries.

The second drop—Matching the design is the challenge of the second drop. For this kitchen floor, I made notches in the pattern felt that corresponded to the grout lines in the flooring design. I lined up these notches with the appropriate grout lines in the second drop. Whether the flooring has a design or not, I make a set mark along each seam to help align the drop (photo above).

This floor is a hard-bodied, inlaid type from Armstrong called Designer Solarian, and it needs an epoxy adhesive under its seams to prevent water penetration. Before the second drop went down, I mixed up a batch of epoxy (Armstrong S-200), lifted up the unglued edge of the first drop, and spread the epoxy under it about 3 in. with a small-notch trowel. I con-



Cove pattern (actual size)

At this outside corner (photo above), the cove stick is in place and the cove pattern, shown actual size in the drawing at left, is held steady as its position is scribed into the felt. The pencil line on the cove pattern lines up with the top of the cove stick.

A finished inside and outside corner **on a coved floor. Material is removed to fashion the inside corner, while a patch is added to create the outside corner—you can see a faint seam on the right-hand side. Cap metal, held in place by brads, finishes the top edge.**

tinued the epoxy another 3 in. out from the seam, and then I troweled latex adhesive over the rest of the drop area. With the second drop in place, I butted the seams together with pressure from my foot, and taped together spots that wanted to separate until the adhesive set up (about an hour).

Coved flooring—A coved floor is essentially the same as a flat-lay floor with a few extra steps. For one, cove stick has to be installed. This looks like a tiny crown molding with a concave face, and it backs the coved flooring. It's mitered at the corners and nailed in place. The pattern felt is laid out the same as in the flat-lay sequence, but the seam line for the drop will be 4 in. closer to the wall, because of the extra material required for the coving.

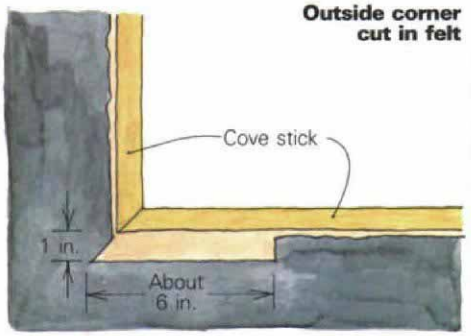
I trim the felt pattern as closely as possible to the base of the cove stick. Then another pattern comes into play. This one is made from a piece of scrap vinyl, and it duplicates a short section of coving with an inside corner cut on one end (drawing, left). This cove pattern fits over the cove stick just like the finish material. First I decide how high the coving will be—usually 2 in. or 3 in. above the stick. Then I make a pencil mark on the cove pattern to correspond with the top of the stick (photo above left). Starting at the door casing, I align the pencil mark with the stick. Then I note the position of the cove pattern on the felt with scribe marks about every 3 ft. around its base. When the felt is placed over the vinyl to mark the cutlines, I reposition the base of the cove pattern on the marks in the felt. With a pencil, I mark the cutline on the vinyl at the top of the cove pattern.

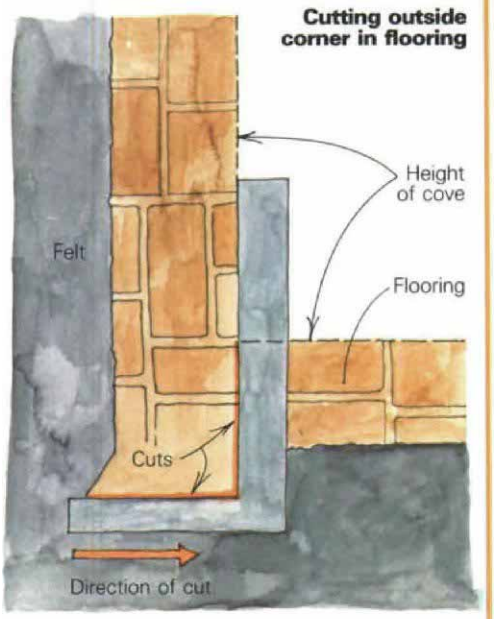
Inside corner cuts are marked by holding the pattern firmly on the cove stick and fitting the curved side into the corner. Mark the corner of the pattern into the felt. The pencil mark on the pattern won't necessarily line up with the stick. Once the material is cut, the inside corners will look like a square cut-out with a tapered notch in one corner. Installed, the cove flaps fold up and the notch forms a crease in the corner (photo below left).

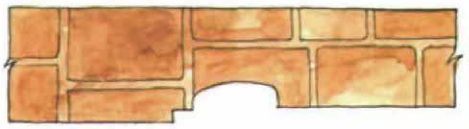
Outside corners—This is the trickiest part of the job, because it requires cutting a patch of material to fill a gap in the coving. This means matching colors and designs, and making accurate cuts, some with beveled edges. The fill piece usually goes on the less conspicuous side of the corner.

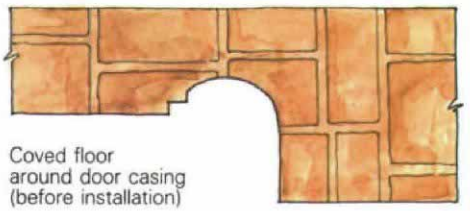
Mark each outside corner on the felt pattern by making a notch in the felt that bisects the angle, then runs parallel with the wall about 1 in. from it (drawing, facing page, top left). This notch indicates which side the fill piece goes on. When all the room's features have been noted on the pattern, place it on the material. Allow room around the edges for the coving, and keep the pattern breaks in mind.

Once the pattern is positioned, tape it down and transfer the scribe marks to the material, using the square around the door trim and the coving pattern along the walls. Connect the cove height marks with the straightedge, and

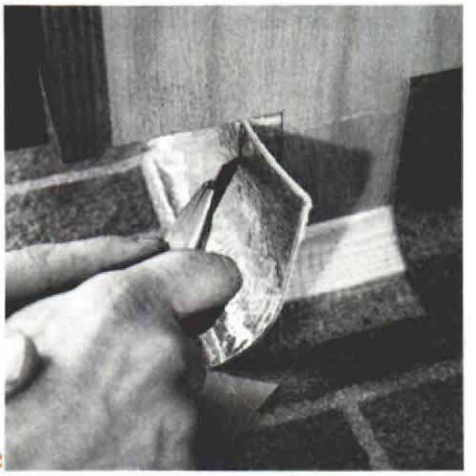





Flat-lay floor
around door casing


Coved floor
around door casing
(before installation)


1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Installing an outside corner. **When the flooring is in place, the flap protruding at each outside corner will need to be trimmed back. The tape on the vinyl reinforced the unfinished cut while the material was rolled into place. An outside corner scribe (1) is the best tool for transferring the cutline to the finish side of the vinyl. Trim off the flap with a sharp utility knife (2). Start the cut at a 45° bevel, and stay with it through the miter joint in the cove stick and into the field cut (3). Now rub this beveled edge with graphite from a soft pencil, and press the fill piece in place (4). The graphite should leave a cutting pattern to follow (5). Start the cut at the top, about ⅛ in. in from the line, with the knife at 45°. As you reach the curve, bring the knife up to 90°, and finish the cut. The piece should fit well (photo facing page, bottom). If it doesn't, get another scrap and try again.**

cut the material as you would a seam. Stop the cut at an outside corner where the two cove height marks intersect. Begin the outside corner by placing the square along the notch in the felt (drawing, second from top). Cut along the square with the utility knife—these are small seams and must be square and straight. Once this cut is finished, find a piece of scrap that matches the pattern of the 90° corner. This is a fill piece that will be used to complete the corner. Label it, and set it aside. Now reinforce the material around the point of the cut with some tape to keep the vinyl from tearing during installation. The photos above show the installation sequence.

At doorways, you have to deal with a transition from flat-lay to cove. Here the flooring is cut around the contours of the trim on the door side, then rises in a curve to cove height on the wall side (drawing, above left).

Coved installation—This sequence is the same as the flat-lay process, with an extra step: corner seams have to be spread with epoxy before the field receives its latex adhesive. Spread the epoxy around the door casings, along the tub or shower, in front of the dishwasher, on both sides of an outside corner—wherever water may have a chance to seep in. When both adhesives are spread out, carefully unroll the flooring and tuck it into its corners. If it's cold, hard surface goods may be stiff and reluctant to bend at the cove. Warm it up by passing a hair dryer back and forth over it, and tack it down with some brads at the top of the coving.

When all the corners are complete, I take out the temporary brads, and install the cap metal with brads 6 in. o. c.

Maintenance—Different types of floors need different types of care, so ask your flooring supplier for warranty information and cleaning instructions. What I have found to work best in my own home is to damp-mop the floor regularly with warm water. Occasionally I add a little mild dish detergent to the mop water, followed by a thorough rinse. I sweep or vacuum the floor frequently, but never use anything abrasive on it. Any vegetable cooking oil will remove scuff marks. □