

## Installation Guidelines: Marmoleum® & Linoleum Sheet

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### General Installation Guidelines

- Forbo Marmoleum® and linoleum sheet flooring may be installed on approved substrates on all grade levels.
- Areas to receive flooring should be clean, fully enclosed and weathertight. The permanent HVAC must be fully operational, controlled and set at a minimum of 68° F (20° C) for a minimum of seven days prior to, during, and seven days after the installation. The material and adhesive should be conditioned in the same manner for at least 48 hours prior to the installation. Areas to receive flooring shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the flooring, and for final inspection.
- Store Marmoleum® rolls standing upright.
- The substrate must be sound, smooth, flat, permanently dry, clean, and free of all foreign materials including, but not limited to, dust, paint, grease, oils, solvents, curing and hardening compounds, sealers, asphalt and old adhesive residue.
- Always conduct moisture tests on **all** concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of the concrete by testing conducted in accordance with ASTM F 1869. The MVER of the concrete must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo L 885 adhesive. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of Forbo's Installation Guide for additional information.
- Determine the internal relative humidity of the concrete by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 85% when using Forbo L 885 adhesive. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of Forbo's Installation Guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 11 when using Forbo L 885 adhesive.
- Always conduct adhesive mat bond tests before beginning the installation. Bond testing will aid in identifying both the working characteristics of the adhesive (open time and working time) for the site conditions, and also any potential bonding problems.
- Material should always be visually inspected prior to installation. If there are any questions regarding the quality of material, contact your local Forbo representative or Forbo Technical Services PRIOR to installation.  
**Any costs (including labor) associated with the replacement of material that was installed with visual defects that could have been seen prior to installation are not covered under warranty.**
- Ensure that all recommendations for substrate and jobsite conditions are met prior to beginning the installation. Beginning the installation is an implied acceptance of site conditions by the parties involved and liability for any failure directly related to inadequate site conditions becomes the responsibility of the installer and/or flooring contractor.
- Use Forbo L 885 adhesive.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive.
- Use material from the same batch/dye lot.
- Install rolls in sequence by roll number and cuts from each individual roll in consecutive order.
- Do Not Reverse sheets for seaming.
- Install one sheet at a time, making sure to place the material into wet adhesive.
- Roll immediately with a 100 pound roller and always check for proper adhesive transfer. In order to achieve a secure bond there must be a complete wet transfer of adhesive to the material backing.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive residue can be removed with a clean white cloth and mineral spirits.
- Linoleum will expand slightly in the width and shrink slightly in the length when placed into the adhesive. Proper installation procedures will compensate for this characteristic.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

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### Cutting and Fitting the First Sheet

Forbo recommends that Marmoleum® and linoleum sheet flooring be installed one sheet at a time. It is also preferable that each sheet be trimmed to fit before adhering. Following these recommendations will give the installer the best opportunity to manage the open and working time of the adhesive and ensure that the flooring material is placed into wet adhesive.



Figure A



Figure B



Figure C

1. Measure the area to be installed and determine the direction in which the material will be installed and seam placement. Seams must be a minimum of 6" away from underlayment and concrete joints, saw cuts, etc.
2. Cut the required length for the first sheet off of the roll, adding approximately 3" - 6" for extra trimming.
3. Fit the first sheet along the main (long) wall and at the ends using standard fitting methods (Figure A).  
**Note:** For sheets longer than approximately 20' - 25', the material may shrink enough when adhered to cause a slight gap at the ends if pre-fitted. For these longer sheets, do not fit the ends at this time. Additional steps, covered later in this section, will be needed in order to ensure a tight fit at the end of longer sheets.
4. Position the fitted sheet in place against the main wall.
5. The factory edge must be trimmed in order to produce a clean edge suitable for seaming. The Forbo Seam & Strip Cutter has been developed to efficiently and effectively trim the factory edge (Figure B). In lieu of the Forbo Seam & Strip Cutter, a straight edge, utility knife and hooked blade knife may also be used. Position the straight edge approximately 1/2" - 3/4" from the factory edge and score the material using the utility knife along the straight edge. After scoring, complete the cut using a hooked blade knife following the score line. Hold the blade at a slight angle to the surface of the material so the seam edge will have a slight undercut.
6. After trimming the seam edge, draw a pencil line on the substrate lengthwise along the trimmed edge (Figure C). This line will serve as a spread line when applying the adhesive.

### Adhering the First Sheet

1. When ready to adhere the first sheet, lap the material back about halfway from one end.



Figure D

2. Begin spreading adhesive at the lap point and work back toward the wall (Figure D). Spread the adhesive from the side wall up to the pencil line at the seam edge. For longer sheets that have not yet been trimmed to fit at the top, stop spreading the adhesive approximately 4' - 6' from the wall to allow for final fitting at the ends after the center portion has been adhered.  
**Note:** Not spreading adhesive approximately 4' - 6' at the end of each sheet allows any shrinkage of the material to occur within the center of the sheet, ensuring a tight fit and seam at the end of the sheet.

3. When installing Marmoleum® and linoleum with a jute backing on porous substrates, no open time is necessary before placing the flooring material into the adhesive. For non-porous substrates, a short open time may be necessary in order to allow the adhesive to develop body before placing the flooring material into the adhesive, but **DO NOT ALLOW THE ADHESIVE TO DRY.** The flooring material **MUST** always be placed into **wet** adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a **wet transfer** of adhesive to the material backing in order to achieve a secure bond.  
When installing Marmoleum® decibel with the acoustic foam backing on porous substrates, a short open time may be necessary before placing the flooring material into the adhesive. For non-porous substrates, a longer open time will be necessary in order to allow the adhesive to develop body before placing the flooring material into the adhesive, but **DO NOT ALLOW THE ADHESIVE TO DRY.** The flooring material **MUST** always be placed into **wet** adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a **wet transfer** of adhesive to the material backing in order to achieve a secure bond.

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**Note:** The open time and working time of adhesives will vary depending on site conditions such as ambient temperature, humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make appropriate adjustments to installation procedures for specific site conditions as may be necessary. Refer to the Adhesives section of Forbo's Installation Guide for additional information regarding adhesive open time and working time.

4. After adhering, immediately roll the flooring in both directions using a 100 pound roller. Roll first across the width and then along the length so that any trapped air pockets will be removed.  
The flooring material **must also remain in contact with the adhesive while the adhesive is drying and curing.** *In order to ensure continuous contact of the material and the adhesive, the natural "roll curl" at the end of each cut should be manually relaxed, both before and during adhering, to remove the tension in the material that is caused by being stored in a roll.*  
Adequate relaxing should enable the material to remain in contact with the adhesive, but if necessary, weight should be applied after rolling to ensure that the flooring material remains in full contact with the adhesive while the adhesive is drying.  
**Note:** To ensure proper transfer of adhesive to the material backing at walls and fixtures, Forbo recommends rolling the edges of the material with a steel seam roller.
5. Repeat the same procedure on the other half of the sheet. Again, for longer sheets that have not yet been trimmed to fit at the end, stop spreading adhesive approximately 4' - 6' from the wall.
6. To finish the ends of longer sheets, fit the ends to walls and fixtures after the center portion of the sheet has been adhered. After fitting, adhere each end in the same manner as before to complete the installation of the first sheet.

### Cutting and Fitting the Second Sheet

1. Cut the required length for the second sheet off of the roll, adding approximately 3" - 6" extra for trimming.
2. If there will only be two sheets installed, the second sheet should be fitted to the opposite long wall and overlapping the first sheet approximately 1/2" - 3/4" at the seam. If there will be additional sheets, simply position the second sheet adjacent to the first sheet, overlapping the first sheet approximately 1/2" - 3/4" at the seam. Prepare the opposite edge for seaming in the same manner as for the first sheet.  
**Note:** DO NOT REVERSE THE SHEETS. INSTALL ALL MARMOLEUM® AND LINOLEUM SHEETS IN THE SAME DIRECTION.
3. Draw a pencil line down the length of the edge of the second sheet.
4. Lap the material back about halfway.
5. Begin spreading the adhesive at the lap point and work back toward the wall. Spread from the edge of the first sheet up to the pencil line at the seam edge of the second sheet. Do not spread the adhesive 4' - 6' from the end of the sheet.



Figure E



Figure F

6. The material must be laid immediately into the wet adhesive and rolled in both directions with a 100 pound roller.
7. After the material has been laid into the adhesive, underscribe the seam using the short scribes with a scribe pin right away (Figure E).  
**Note:** Underscribers should be adjusted to produce a net fit at the seam. The seam edges should just meet, with no pressure or fullness. This will compensate for any slight expansion that may occur.
8. Cut the material along the scribe line using a hooked blade knife and holding it at an angle so to slightly undercut the material (Figure F).
9. Roll the seam with a hand roller, making sure that the flooring material gets into wet adhesive.
10. Repeat the same procedure on the other half of the sheet.
11. Finish the ends of each sheet in the same manner as the first sheet.
12. Repeat the same procedures for each sheet, completing one sheet at a time until the job is completed.

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13. If cross or butt seams must be made, following the steps below to allow for any shrinkage that may occur in the length:

Step 1: Straight edge and undercut at an angle the end of the first sheet.

Step 2: Draw a pencil line at the end of the first sheet. Spread the adhesive to the line and lay in the material.

Step 3: Roll the material in both directions with a 100 pound roller.

Step 4: Overlap the second sheet at butt seam approximately 1".

Step 5: Fully adhere and roll the second sheet as usual, except for the last 18" at the butt seam; wait 20 - 30 minutes.

Step 6: Spread the adhesive for the last 18", lay in the material, underscribe the seam to a net fit, cut the material and roll in both directions with a 100 pound roller.

**Note:** In some situations, such as installing material in a narrow hallway where only one piece of material is being used, tubing the material will be necessary. In these situations, close attention should be made in making sure the material is laid into wet adhesive, as well as being sure to avoid adhesive overlap which could result in a ridge line where the material was folded back. Tubing minimizes the shrinking of the material.

### Stove Bar Marks

When Marmoleum® and linoleum products are in the curing process during manufacturing, the material is suspended in large loops in the "drying rooms." The top of each loop (Figure G, part A), known as a pole mark, is cut off and recycled. The bottom of each loop (Figure G, part B) is called a "stove bar mark" and will appear approximately in the center of each roll (Figure H). When installing material with a stove bar mark, simply spread the adhesive with the flat side of the trowel in the stove bar mark area on the backside of the sheet (Figure I) and spread the adhesive on the floor following standard recommendations. Place the material directly into the wet adhesive. Be sure that when placing the stove bar mark into the wet adhesive to massage the material down and push the material flat. Roll the material in all directions, starting across the width of the material. Be sure the stove bar mark is rolled first to avoid trapping the tension in the material. Place weights on the stove bar mark until the adhesive has set up.

Note: Stove bar marks are not a material defect. If a problem occurs, it is directly related to improper installation techniques.

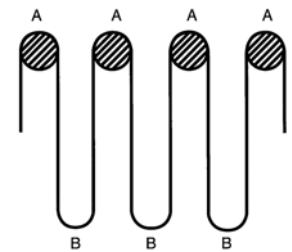


Figure G



Figure H

### Drying Room Yellowing / Ambering

While Marmoleum® and linoleum products are maturing in the drying stoves, a yellow cast, called "drying room yellowing" or "ambering" may appear on the surface. This yellow cast is caused by the oxidation of linseed oil and is TEMPORARY. It occurs intermittently and with varying intensity. It is most noticeable on blue and grey shades of material. When the material is exposed to light, the drying room yellowing will disappear. The process may take as little as a few hours in bright sunlight or longer with artificial light. Because this is a natural occurrence in the product, there is no set time frame for the yellowing to disappear. This is not a material defect. In regards to floor care, applying finish to the material before the drying room yellowing disappears will make no difference; it will still disappear with exposure to light.



Figure I