



Forbo Flooring Systems
Installation Guide

creating better environments

Forbo
FLOORING SYSTEMS

Installation Guide

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Foreword

The finest floor covering made will not look good nor perform well if it is not installed and cared for properly. In the flooring industry, 97% - 98% of all complaints are installation, substrate or floor care related.

The first step to a successful installation is choosing the right floor covering for the particular application. No single flooring product is right for every application. If there is any doubt as to the suitability of a product for a particular application, always check with the manufacturer for recommendations.

With today's technology, flooring products, substrate preparation products, adhesives and installation techniques change at a rapid pace. It is the responsibility of the installer to assure that flooring products are installed in strict accordance with the manufacturer's recommendations.

This installation guide is just one of the many technical support services provided by Forbo Flooring. Do not install any floor covering product until you are fully educated and familiar with installation procedures and recommendations, and have ensured that all site requirements have been met.

IMPORTANT!

The procedures and recommendations described in this manual have been carefully developed to offer the best opportunity for a proper and successful installation with Forbo products. Following these guidelines will offer the consumer the full value of the manufacturer's warranty. Any deviation from these guidelines may result in an installation failure. Failure to follow these guidelines does not affect the manufacturer's limited warranty, but it does increase the risk of an installation failure.

Installation Training

Professionalism and Attitude

“Professionalism” is not merely possessing mechanical skills and knowledge, it is also an attitude. Having the right attitude and conducting yourself in a professional manner at all times is essential to gaining the respect of all those you come into contact with. Above all else, taking pride in your work is the key to successful installations.

Take the time to review the manufacturer’s installation guidelines. If you ever have any doubts, do not proceed with the installation. Call your local supplier for further information. The liability of the installation rests solely with the installer and flooring contractor. The warranty from the manufacturer covers only the product, and is in no way contingent upon installation or floor care practices.

Professionalism and Education

The flooring industry is continually changing. In order to remain successful, those working in the industry must also change, and education is the key to this change.

The Forbo Associate and Master Mechanic courses are industry benchmarks for installation training. In addition to being dedicated to offering the resilient flooring installer the most comprehensive and professional installation training courses in the industry, Forbo Flooring also offers an array of other educational opportunities such as product presentations, supplier training seminars, and dealer installation clinics for flooring products, Moisture Limitor, and Bulletin Board.

The Forbo Associate and Master Mechanic installation training courses are PASS/FAIL. In order to qualify for a certificate, the installer must successfully and satisfactorily complete the installation tasks, have a thorough knowledge of the information presented throughout the course, and most importantly, demonstrate a professional attitude.

Upon successful completion of the course, the installer will receive a certificate suitable for framing, a laminated wallet card to carry, and a patch that can be sewn on a shirt, jacket, etc. Qualified installers are maintained in a database utilized for referrals throughout North America.



Forbo Flooring Systems
Attn: Technical Services
P.O. Box 667
Hazleton, PA 18202
Email: info.na@forbo.com
Website: www.forboflooringNA.com
Phone: 570 459 0771
Fax: 570 450 0330
Toll Free: 800 842 7839

Associate Mechanic Program

Forbo’s ASSOCIATE MECHANIC installation training covers a range of topics and techniques including:

- Substrate evaluation and preparation
- Moisture Limitor
- Forbo product knowledge
- Tools
- Fitting methods
- Marmoleum® installation
- Vinyl installation
- Seaming
- Repairs
- Heat welding
- Floor care
- PROFESSIONALISM



This training is intended for experienced resilient flooring installers who desire to improve their level of knowledge and skill.

Master Mechanic Program

Forbo’s MASTER MECHANIC installation training is tailored for the Forbo Associate Mechanic who desires to reach the highest level in his trade. This intensive and rewarding course covers a range of advanced installation topics and techniques including:

- Accent heat welding
- Specialty tools
- Flash coving
- Heat welding flashcovered seams and corners
- Inset and design installations
- PROFESSIONALISM



Training Centers

Associate and Master Mechanic installation training is offered at Forbo Flooring Training Centers in the following locations:

- Hazleton, Pennsylvania
- Reno, Nevada
- Dallas, Texas
- Mississauga, Ontario

Forbo will provide all meals, hotel accommodations and transportation to and from the hotel and Training Center.

The student is responsible for all travel, including travel to the hotel from the Wilkes-Barre/Scranton International Airport for our Pennsylvania center; Reno International Airport for our Reno center; DFW Airport or Love Field for our Texas center; Toronto Pearson International Airport for our Ontario center.

If you are a professional and desire to enhance your skills and knowledge, contact your local Forbo supplier or Forbo Flooring for training dates, availability and an application form.

Forbo Product Descriptions

Marmoleum® and Linoleum Products

Marmoleum® and linoleum products from Forbo are made primarily from natural ingredients including oxidized linseed oil, rosins, and wood flour. These ingredients are calendared onto a jute backing for sheet, and a polyester backing for tile. Marmoleum® is available in both a sheet and tile format.

Applications for Marmoleum® sheet and tile include education, healthcare, nursing homes, retail shops, restaurants, offices, and hospitality.

Walton sheet is a solid colored linoleum calendared onto a jute backing.

Applications for Walton linoleum include dance floors, television studios, museums, art galleries. Walton linoleum is also used for inlay and accent work.

Project Vinyl Products

Forbo offers several ranges of vinyl floor covering which vary in manufacturing processes and ingredients. The primary composition of each range is a mix of polyvinyl chloride resins, plasticizers, stabilizers, fillers and pigments.

Slip resistance for Eternal Step SR is achieved by embedding a substantial quantity of appropriately sized aluminum oxide and carborundum chips in the wear layer surface.

Applications for Eternal Step SR include indoor ramps, wet areas, hydrotherapy, entry, produce area, commercial kitchens.

The wear surface of Eternal is 99.3% pure vinyl and provides for extreme stain and chemical resistance, ease of care and unsurpassed indentation resistance.

Applications for Eternal include operating rooms, veterinary clinics, healthcare, research centers, and laboratories.

ColoRex® SD/EC is a homogeneous, pressed vinyl conductive or static dissipative tile. The random burled pattern is the result of conductive elements dispersed precisely throughout each tile, ensuring that ColoRex® SD/EC tiles will maintain their electrical properties for the life of the tile.

Applications for ColoRex® SD/EC include computer rooms, production areas for computer chips, electronic and laser equipment, laboratories, clean rooms, and access panels.

Textile Products

Forbo Flotex® offers the great features of textile flooring, including comfort underfoot and sound insulation, while providing durability and low-cost maintenance.

Hardwearing and stain-resistant, Flotex® is ideal for heavy foot and wheel traffic. It is completely waterproof and features Sanitized® antimicrobial treatment built into its fiber and backing to prevent the growth of mold and bacteria. Flotex® is available in both sheet and tile format.

Applications for Flotex® include waiting rooms, senior living and long-term care facilities, offices, outpatient clinics, locker rooms, dining areas, health clubs, and airport applications.

Entrance Flooring

Forbo Coral® Entrance Flooring provides long-lasting protection with a range of products to meet the individual requirements of each facility. Coral® Entrance Flooring limits the amount of soil and moisture brought into a building, thus preventing excessive amounts of dirt and grit build-up. Coral® Entrance Flooring reduces floor care labor, water and chemical usage and cleaning costs, while increasing the life and sustainable performance of the facility's flooring. Coral® Entrance Flooring is comprised of an exceptionally versatile range of "clean-off" entrance system products, each performing a specific cleaning function. Each Coral® range has been designed with complementary colors so that they can be integrated into any design scheme.

Bulletin Board

Forbo Bulletin Board is a homogeneous tackable surface material made of primary natural materials consisting of linseed oil, cork, rosin binders and dry pigments mixed and calendared onto a natural jute backing. The uni-color extends throughout the thickness of the material.

Applications for Bulletin Board include education, healthcare, nursing homes, retail shops, and offices.

Wall Base

Forbo Wall Base is produced in roll form and constructed from high grade resins, thermoplastic binders, fillers and pigments.

Applications for Wall Base include education, healthcare, nursing homes, retail shops, restaurants, offices, and hospitality.

Installation Accessories

Forbo Installation Accessories are constructed from thermoplastic rubber/vinyl alloy, binders, fillers and pigments.

Applications for Installation Accessories include education, healthcare, nursing homes, retail shops, restaurants, offices, and hospitality.



FLOORING SYSTEMS

Product Application Chart

Forbo floor covering products are recommended for interior applications only.

- chart key
 ●●● best choice / excellent performance
 ●● very good performance
 ● acceptable

| area of application | marmoleum® | MCS | marmoleum® dual tile / MCT | marmoleum® surface solutions | bulletin board® | eternal | eternal step SR | colorex® | flotex® sheet / flotex® tile | coral® / nuway® |
|---------------------------------------|------------|-----|----------------------------|------------------------------|-----------------|---------|-----------------|----------|------------------------------|-----------------|
| healthcare | | | | | | | | | | |
| cafeteria / dining | ●●● | ●● | ●●● | | | ●●● | | ● | ●●● | |
| corridors | ●●● | ●● | ●●● | | | ●● | | ● | ●● | |
| desks / cupboards / furniture systems | | | | ●●● | | | | | | |
| elevators | ●●● | ●● | ●● | | | ● | ● | ● | ●● | |
| emergency room | ●● | ● | ●● | | | ●●● | | ●●● | | |
| exam / procedure room | ●● | ●● | ●● | | | ●●● | | ●●● | | |
| hydrotherapy room | | | | | | | ●●● | ●●● | | |
| laboratories | | | | | | ●●● | ●● | ●●● | | |
| lobbies / entryways | ●●● | ●● | ●●● | | | ●● | | ● | ●● | ●●● |
| nurses station | ●●● | ●● | ●●● | | | ●● | | ● | ●● | |
| office / administrative | ●●● | ●● | ●●● | | | ●● | | | ●●● | |
| patient room / physical therapy room | ●●● | ●● | ●●● | | | ●●● | | ●●● | ●●● | |
| pharmacy | ●●● | ●●● | ●●● | | | ●●● | | ●● | ●● | |
| ramps (indoor) | | | | | | | ●●● | | | |
| surgeries / scrub area | | | | | | ●●● | | ●●● | | |
| tackable wall surface / partitions | | | | ●●● | ●●● | | | | | |
| utility room / service area | ●● | ●● | ●● | | | ●●● | | | | |
| waiting areas | ●●● | ●● | ●●● | | | ●● | | | ●●● | |
| education / institutional | | | | | | | | | | |
| auditoriums | ●● | ● | ●● | | | | | | ●● | |
| cafeteria / dining | ●●● | ●● | ●●● | | | ●●● | | ● | ●●● | |
| classrooms | ●●● | ●● | ●●● | | | ●● | | ● | ●●● | |
| computer rooms | ●● | ●● | ●● | | | ●● | | ●●● | ● | |
| corridors | ●●● | ●● | ●●● | | | ●● | | ● | ●● | |
| desks / cupboards / furniture systems | | | | ●●● | | | | | | |
| dormitory rooms | ●●● | ●●● | ●●● | | | ●● | | ● | ●●● | |
| gymnasium / multi-purpose room | ●● | ●● | ●● | | | ● | | | | |
| kitchen / food prep | | | | | | | ●● | | | |
| laboratories | | | | | | ●●● | ●● | ●●● | | |
| lobbies / entryways | ●●● | ●● | ●●● | | | ●● | | ● | ●● | ●●● |
| locker rooms | | | | | | | ●●● | | ●●● | |
| office / administrative | ●●● | ●●● | ●●● | | | ●● | | | ●●● | |
| ramps (indoor) | | | | | | | ●●● | | | |
| tackable wall surface / partitions | | | | ●●● | ●●● | | | | | |
| utility room / service area | ●● | ●● | ●● | | | ●●● | | | | |
| corporate | | | | | | | | | | |
| computer rooms | ●● | ●● | ●● | | | ●● | | ●●● | ● | |
| corridors | ●●● | ●● | ●●● | | | ●● | | ● | ●● | |
| desks / cupboards / furniture systems | | | | ●●● | | | | | | |
| elevators | ●●● | ●● | ●● | | | ● | ● | ● | ●● | |
| lobbies / entryways | ●●● | ●● | ●●● | | | ●● | | ● | ●● | ●●● |
| office / conference room | ●●● | ●● | ●●● | | | ●● | | | ●●● | |
| ramps (indoor) | | | | | | | ●●● | | | |
| restrooms | ●● | ● | ●● | | | ●● | ●● | | | |
| tackable wall surface / partitions | | | | ●●● | ●●● | | | | | |
| vending area / lunchroom | ●●● | ●●● | ●●● | | | ●●● | | ● | ●●● | |
| retail / hospitality | | | | | | | | | | |
| corridors | ●●● | ●● | ●●● | | | ●● | | ● | ●● | |
| checkout counters / tabletops | | | | ●●● | | | | | | |
| eating areas | ●●● | ●● | ●●● | | | ●●● | | ● | ●●● | |
| elevators | ●●● | ●● | ●● | | | ● | ● | ● | ●● | |
| exercise room / health clubs | ●● | ● | ●● | | | ●● | | | ●●● | |
| deli / bakery | ●● | ●● | ●● | | | ● | ●●● | | | |
| food service | ●●● | ●● | ●●● | | | ●●● | | ● | | |
| frozen food / dairy | | | | | | | ●●● | | | |
| lobbies / entryways | ●●● | ●● | ●●● | | | ●● | | ● | ●● | ●●● |
| sales floors | ●●● | ●● | ●●● | | | ● | | ●● | ●● | |
| specialty shops / boutiques | ●●● | ●● | ●●● | | | ●● | | | ●● | |
| tackable wall surface / partitions | | | | ●●● | ●●● | | | | | |
| vending areas | ●●● | ●●● | ●●● | | | ●●● | | ● | ●●● | |
| industrial | | | | | | | | | | |
| clean rooms / sterile packaging | | | | | | ●●● | | ●●● | | |
| conductive / static dissipative | | | | | | | | ●●● | | |
| pharmaceutical | | | | | | | | ●●● | | |
| research / production lab | ● | ● | ● | | | ●●● | ● | ●●● | | |
| small parts assembly | ●● | ●● | ●● | | | ●● | ● | ●●● | | |
| tackable wall surface / partitions | | | | ●●● | ●●● | | | | | |
| warehouse / manufacturing area | ●● | ● | ●● | | | ●● | ●● | ●●● | | |
| assisted living / military | | | | | | | | | | |
| barracks / residence rooms | ●●● | ●●● | ●●● | | | ●● | ●● | | ●●● | |
| common areas | ●●● | ●●● | ●●● | | | ●● | ●● | | ●●● | |
| corridors | ●●● | ●● | ●●● | | | ●● | | ● | ●● | |
| desks / cupboards / furniture systems | | | | ●●● | | | | | | |
| eating areas | ●●● | ●● | ●●● | | | ●●● | | ● | ●●● | |
| lobbies / entryways | ●●● | ●● | ●●● | | | ●● | | ● | ●● | ●●● |
| office / administrative | ●●● | ●● | ●●● | | | ●● | | | ●●● | |
| tackable wall surface / partitions | | | | ●●● | ●●● | | | | | |

Installation Fast Facts: Marmoleum® and Linoleum Sheet

GAUGE: 1/10" (2.5 mm) - Marmoleum® & Walton
 0.137" (3.5 mm) - Marmoleum® decibel
 0.080" (2.0 mm) - MCS

WIDTH: 79" (2 M)

LENGTH: 105' (32 M) - Marmoleum®, Walton, MCS
 89' (27 M) - Marmoleum® decibel



Transparent.
Quantified.
Global.

Installation Fast Facts

- Forbo Marmoleum®, Marmoleum® decibel, MCS and Walton 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 should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- Determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo L 885 adhesive.
- Determine the internal relative humidity of concrete substrates 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 concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
- The concrete surface pH should be tested and must not exceed a pH of 11 when using Forbo L 885 adhesive.
- Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
- 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 specific site conditions and potential bonding problems.
- Use Forbo L 885 adhesive. For optimum performance in areas with heavy rolling loads, or for additional protection from topical moisture, Forbo 660 adhesive may be used. For additional information, contact Forbo Technical Services.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive.
- Install rolls and cuts in consecutive order. Do Not Reverse sheets for seaming.
- Install one sheet at a time. For 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 appropriate 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. 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 to ensure that the flooring material remains in full contact with the adhesive while the adhesive is drying.
- **Note:** The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary
- After adhering, immediately roll the flooring in both directions using a 100 pound roller.
- When installing material with a stove bar over porous substrates, it may be helpful to flat trowel adhesive onto the material backing as a primer in the area of the stove bar. Doing so will help to ensure optimum adhesive transfer and a secure bond. This will slow the drying of the adhesive, so weighing down the stove bar area after rolling is also recommended to make sure that the material stays in contact with the adhesive until the adhesive has fully dried.
- Underscribe seams for a net fit and always cut the material with a **slight** undercut. Refer to the Installation section elsewhere in this guide for additional information.
- Heat welding is optional, but recommended. Use only Marmoweld® welding rod. Do Not chemical weld. Refer to the Heat Welding section elsewhere in this guide for additional information.
- Flash coving is optional. Refer to the Flash Coving section elsewhere in this guide for additional information.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

These "Fast Facts" are intended only as an overview. More detailed information can be found in other sections of this guide. For questions regarding information not included in this guide, contact Forbo Technical Services at 800 842 7839.

Installation Fast Facts: Marmoleum® Ohmex

GAUGE: 1/10" (2.5 mm)
WIDTH: 79" (2 M)
LENGTH: 105' (32 M)



Installation Fast Facts

- Forbo Marmoleum® Ohmex 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 should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- Determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 3.5 lbs. per 1,000 square feet in 24 hours when using Forbo 615 adhesive.
- Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 75% when using Forbo 615 adhesive.
- When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
- The concrete surface pH should be tested and must not exceed a pH of 10 when using Forbo 615 adhesive.
- Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
- 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 specific site conditions and potential bonding problems.
- Use Forbo 615 adhesive.
- Use the V notched trowel attached to the pail to apply the adhesive.
- Install grounding straps into wet adhesive the entire width of the room running crosswise to the direction of the sheets. Refer to the installation section elsewhere in this guide for additional information.
- Install rolls and cuts in consecutive order. Do Not Reverse sheets for seaming.
- Install one sheet at a time. For non-porous substrates a short open time may be appropriate 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**. For porous substrates, no open time is necessary before placing the flooring material into the adhesive. 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. 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 to ensure that the flooring material remains in full contact with the adhesive while the adhesive is drying.
- **Note:** The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary
- After adhering, immediately roll the flooring in both directions using a 100 pound roller.
- When installing material with a stove bar, flat trowel adhesive onto the material backing as a primer in the area of the stove bar, and weigh down the stove bar area after rolling.
- Underscribe seams for a net fit and always cut the material with a **slight** undercut. Refer to the Installation section elsewhere in this guide for additional information.
- Heat welding is optional, but recommended. Use only Marmoweld® welding rod. Do Not chemical weld. Refer to the Heat Welding section elsewhere in this guide for additional information.
- Flash coving is optional. Refer to the Flash Coving section elsewhere in this guide for additional information.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

These "Fast Facts" are intended only as an overview. More detailed information can be found in other sections of this guide. For questions regarding information not included in this guide, contact Forbo Technical Services at 800 842 7839.

Installation Fast Facts: Eternal (Classic, Marble, Wood, Wood Decibel, Step SR)

| | |
|---------|---|
| GAUGE: | 0.080" (2.0 mm) |
| | 0.134" (3.4 mm) - Eternal Wood Decibel only |
| WIDTH: | 79" (2 M) |
| LENGTH: | 82' (25 M) |

Installation Fast Facts

- Forbo Eternal vinyl 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 should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- Determine the moisture condition of all concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo V 885 adhesive.
- Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 85% when using Forbo V 885 adhesive.
- When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
- The concrete surface pH should be tested and must not exceed a pH of 11 when using Forbo V 885 adhesive.
- Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
- 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 specific site conditions and potential bonding problems.
- Use Forbo V 885 adhesive. For optimum performance in areas with heavy rolling loads, or for additional protection from topical moisture, Forbo 660 adhesive may be used. For additional information, contact Forbo Technical Services.
- Use a 1/32" x 1/16" x 1/32" fine notch trowel to apply the adhesive.
- Install rolls and cuts in consecutive order. Do Not Reverse sheets for seaming when installing Eternal Wood and Eternal Wood decibel. Reverse sheets for seaming when installing all other Eternal products.
- For 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be transfer of adhesive to the material backing in order to achieve a secure bond.
Note: The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary.
- After adhering, immediately roll the flooring in both directions using a 100 pound roller.
- Double stick vertical surfaces. Allow the adhesive to develop body, but not completely dry, on both surfaces before installing the material. Hand roll vertical surfaces using a steel seam roller.
- All seams must be heat welded. Use only Forbo Eternal welding rod. Refer to the Heat Welding section elsewhere in this guide for additional information.
- Flash coving is optional. Refer to the Flash Coving section elsewhere in this guide for additional information.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: Flotex® Sheet

GAUGE: 0.17" (4.3 mm)
 WIDTH: 79" (2 M)
 LENGTH: 98'4" (30 M)

Installation Fast Facts

- Flotex® 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 should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- Determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo FRS 885 adhesive.
- Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 85% when using Forbo FRS 885 adhesive.
- When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
- The concrete surface pH should be tested and must not exceed a pH of 11 when using Forbo FRS 885 adhesive.
- Store Flotex® sheet flooring standing on end and acclimate material to jobsite conditions for a minimum of 48 hours prior to installation.
Note: Storing the rolls laying down will result in pile crush. Forbo will not honor claims relating to pile crush if the rolls were stored laying down.
- Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
- 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 specific site conditions and potential bonding problems.
- Use Forbo FRS 885 adhesive. For optimum performance in areas with heavy rolling loads, or for additional protection from topical moisture, Forbo 660 adhesive may be used. For additional information, contact Forbo Technical Services.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive.
- **Install rolls and cuts in consecutive order.** Forbo will not honor shading claims where the Flotex® has been installed out of sequence.
- Do Not Reverse sheets for seaming. Install with all arrows pointing in the same direction. Refer to the Installation section elsewhere in this guide for additional information.
- Install running lengthwise in corridors.
- Butt factory edges for seaming.
- For 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a transfer of adhesive to the material backing in order to achieve a secure bond.
Note: The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary.
- After adhering, immediately roll the flooring in both directions using a 75 pound roller.
- Flash coving is optional. Refer to the Flash Coving section elsewhere in this guide for additional information.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: Marmoleum® Tile

| | |
|------------|---|
| GAUGE: | 1/10" (2.5 mm) - Dual Tile 0.080" (2.0 mm) - MCT |
| TILE SIZE: | 13" x 13" approx. (33 cm x 33 cm) - Dual Tile & MCT 20" x 20" approx. (50 cm x 50 cm) - Dual Tile |
| CARTON: | 13" x 13": 9 tiles (10.76 ft ² , 1 M ²) - Dual Tile 45 tiles (53.82 ft ² , 5 M ²) - Dual Tile & MCT 20" x 20": 20 tiles (53.82 ft ² , 5 M ²) - Dual Tile |



Transparent.
Quantified.
Global.

Installation Fast Facts

- Forbo Marmoleum® Dual Tile and Marmoleum® Composition Tile (MCT) may be installed on approved substrates on all grade levels.
- Areas to receive flooring should be clean, fully enclosed and weathertight. The permanent HVAC should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- Determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo T 940 adhesive or 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo L 885 adhesive.
- Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 75% when using Forbo T 940 adhesive or 85% when using Forbo L 885 adhesive.
- When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
- The concrete surface pH should be tested and must not exceed a pH of 10 when using Forbo T 940 adhesive or a pH of 11 when using Forbo L 885 adhesive.
- Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
- 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 specific site conditions and potential bonding problems.
- Use Forbo T 940 adhesive. For areas with high moisture, use Forbo L 885 adhesive. For optimum performance in areas with heavy rolling loads, or for additional protection from topical moisture, Forbo 660 adhesive may be used. For additional information, contact Forbo Technical Services.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive.
- Install cartons in consecutive order.
- **Install tiles in alternating directions (quarter turned).** Refer to the Tile Products section elsewhere in this guide for additional information.
- Install tiles into wet adhesive. For 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.
Note: The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary
- After adhering, immediately roll the flooring in both directions using a 100 pound roller. Re-roll the tile periodically to ensure that the tile remains in contact with the adhesive while the adhesive is drying.
- Heat welding is optional. Use Marmoweld® welding rod only. Do Not chemical weld. Refer to the Heat Welding section elsewhere in this guide for additional information.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: ColoRex® SD/EC Tile

| | |
|---------|--|
| GAUGE: | 0.080" (2.0 mm) |
| SIZE: | 24.2" x 24.2" approx. (61.5 cm x 61.5 cm) |
| CARTON: | 14 tiles (56.81 ft ² , 5.295 M ²) |

Installation Fast Facts

- Forbo ColoRex® SD/EC ESD control tile 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 should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- Determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo C 930 conductive adhesive or 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo V 885 non-conductive adhesive.
- Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 75% when using Forbo C 930 conductive adhesive or 85% when using Forbo V 885 non-conductive adhesive.
- When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
- The concrete surface pH should be tested and must not exceed a pH of 10 when using Forbo C 930 conductive adhesive or a pH of 11 when using Forbo V 885 non-conductive adhesive.
- Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
- 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 specific site conditions and potential bonding problems.
- Use Forbo C 930 adhesive for conductive installations. Use Forbo V 885 adhesive for non-conductive installations. For optimum performance in areas with heavy rolling loads, or for additional protection from topical moisture, Forbo 660 adhesive may be used for non-conductive installations. For additional information, contact Forbo Technical Services.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive when using Forbo C 930 for ESD control installations. Use a 1/32" x 1/16" x 1/32" fine notch trowel to apply the adhesive when using alternative adhesives for non-ESD control installations.
- Install a minimum of one grounding strap for every 2,000 square feet of uninterrupted tile. Grounding straps must extend a minimum of three feet under the tile at each grounding point. Refer to the Tile Products section elsewhere in this guide for additional information.
- Install cartons in consecutive order.
- Install tiles with the directional arrows pointing in the same direction.
- For 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a transfer of adhesive to the material backing in order to achieve a secure bond.
Note: The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary
- After adhering, immediately roll the flooring in both directions using a 100 pound roller.
- Heat welding is optional. Use only Forbo ColoRex® welding rod. Refer to the Heat Welding section elsewhere in this guide for additional information.
- Flash coving is optional. Refer to the Flash Coving section elsewhere in this guide for additional information.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: Flotex® Tile

GAUGE: 0.21" (5.3 mm)
 SIZE: 20" x 20" approx. (50 cm x 50 cm)
 CARTON: 12 tiles (32.3 ft², 3 M²)

Installation Fast Facts

- Flotex® tile 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 should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
 - Determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
 - Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo FRT 950 adhesive or 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo FRS 885 adhesive.
 - Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 75% when using Forbo FRT 950 adhesive or 85% when using Forbo FRS 885 adhesive.
 - When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
 - The concrete surface pH should be tested and must not exceed a pH of 10 when using Forbo FRT 950 adhesive or a pH of 11 when using Forbo FRS 885 adhesive.
 - Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
 - 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 specific site conditions and potential bonding problems.
 - Use Forbo FRT 950 adhesive.
 - Use 3/8" nap roller to apply the adhesive.
 - Allow the Forbo FRT 950 adhesive to turn clear and dry to the touch before installing the Flotex® tiles. After turning clear, the flooring **MUST** be placed into the adhesive within four hours.
 - **Forbo FRT 950 is a releasable adhesive. For permanent applications, Forbo FRS 885 adhesive may be used. For optimum performance in areas that may need additional protection from topical moisture, Forbo 660 adhesive may be used. For additional information, contact Forbo Technical Services.**
- When using Forbo FRS 885 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a transfer of adhesive to the material backing in order to achieve a secure bond.
- Note:** The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary.
- **Install the tile with the arrows on adjacent tiles at right angles (quarter turned).** The arrows on alternate tiles should run in the same direction. Refer to the Tile Products section elsewhere in this guide for additional information.
- Note:** Certain patterns may be installed with arrows all in the same direction.
- After adhering, immediately roll the flooring in both directions using a 75 pound roller.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

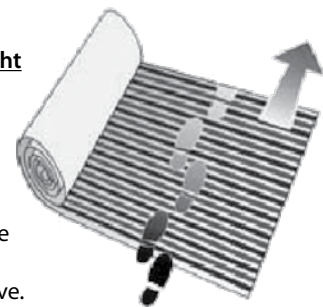
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Installation Fast Facts: Coral® Classic, Brush Activ, & Duo

GAUGE: 0.394" (10 mm)
 WIDTH: 79" (2 M)
 LENGTH: 90.22' (27.5 M)

Installation Fast Facts

- Coral® Classic, Brush Activ and Duo Entrance 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 should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
 - Determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
 - Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo FRS 885 adhesive.
 - Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 85% when using Forbo FRS 885 adhesive.
 - When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
 - The concrete surface pH should be tested and must not exceed a pH of 11 when using Forbo FRS 885 adhesive.
 - Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
 - 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 specific site conditions and potential bonding problems.
 - Use Forbo FRS 885 adhesive. For optimum performance in areas that may need additional protection from topical moisture, Forbo 660 adhesive may be used. For additional information, contact Forbo Technical Services .
 - Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive.
 - The direction in which the Coral® Duo is produced is not the traffic direction. **The ribs should be running at right angles to the walking direction.**
 - **Install rolls and cuts in consecutive order.** Forbo will not honor shading claims where the Coral® Classic, Brush Activ or Duo Entrance Flooring has been installed out of sequence.
 - Do Not Reverse sheets for seaming. Install all sheets in the same direction. Refer to the Installation section elsewhere in this guide for additional information.
 - Trim the factory edges using a straightedge and knife and butt the edges for seaming. For Coral® Duo, take care to continue the rib pattern from sheet to sheet.
 - For 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a transfer of adhesive to the material backing in order to achieve a secure bond.
- Note:** The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary
- After adhering, immediately roll the flooring in both directions using a 75 pound roller.



Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: Coral® Grip

| | |
|---------|--|
| GAUGE: | 0.470" (12 mm) Open Structure 0.669" (17 mm) With Backing |
| WIDTH: | 48" (1.22 M) |
| LENGTH: | 49.2' (15 M) Open Structure 32.8' (10 M) With Backing |

Installation Fast Facts

- Coral® Grip Entrance Flooring may be installed on approved substrates on all grade levels and is suitable for both interior and exterior use.
- For interior applications, 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. For exterior applications, the installation should be done when weather conditions are comparable to a comfortable indoor environment and the temperature is a minimum of 68° F (20° C). Acclimate the material and adhesive to the jobsite conditions for a minimum of 48 hours prior to installation.
- For interior applications only, determine the moisture condition of **all** concrete substrates, regardless of age or grade level.
- Determine the moisture vapor emission rate (MVER) of concrete substrates by testing conducted in accordance with ASTM F 1869. The concrete MVER must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo FRS 885 adhesive.
- Determine the internal relative humidity of concrete substrates by testing conducted in accordance with ASTM F 2170. The internal relative humidity of the concrete must not exceed 85% when using Forbo FRS 885 adhesive.
- When concrete moisture conditions exceed these requirements, refer to the Moisture Limitor section elsewhere in this guide for additional information.
- The concrete surface pH should be tested and must not exceed a pH of 11 when using Forbo FRS 885 adhesive.
- Always use the highest quality patching and leveling compounds and always follow the manufacturer's recommendations for their use and application.
- 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 specific site conditions and potential bonding problems.
- Use Forbo FRS 885 adhesive. For exterior applications using **only** Coral® Grip, or for optimum performance in interior areas that may need additional protection from topical moisture, use Forbo 660 adhesive. For additional information, contact Forbo Technical Services.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive.
- **Install rolls and cuts in consecutive order.**
- Do Not Reverse sheets for seaming. Install all sheets in the same direction. Refer to the Installation section elsewhere in this guide for additional information.
- Straight edge and butt edges for seaming.
- For 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a transfer of adhesive to the material backing in order to achieve a secure bond.
Note: The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary.
- After adhering, immediately roll the flooring in both directions using a 75 pound roller.

Floor Care Fast Facts

- In order to allow the adhesive to dry and cure properly, wait at least five days following the installation before conducting initial cleaning or other wet cleaning procedures. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.
- Do not allow heavy traffic or rolling loads for a minimum of 72 hours following the installation. For installations over non-porous substrates, additional time may be necessary because the adhesive may take longer to dry and cure.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: Bulletin Board

GAUGE: 0.25" (6.0 mm)
 WIDTH: 48" (122 cm) **Note:** Some colors are available in 72" (183 cm) width.
 LENGTH: 90' (28 M)



Installation Fast Facts

- Bulletin Board must be installed on substrates that are sound, smooth, rigid, flat, dry, clean, and free of all foreign materials such as, dust, grease, oils, solvents, sealers, and old adhesive residue.
 - Areas to receive material should be clean, fully enclosed and weathertight. The permanent HVAC should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
 - 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 specific site conditions and potential bonding problems.
 - Use Forbo L 910W adhesive.
 - Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive. Be sure to hold the trowel at approximately a 60° angle to the wall to ensure that the proper amount of adhesive is applied.
 - Do not mix material from different batches/dye lots. Install rolls and cuts in consecutive order. Do Not Reverse sheets for seaming.
 - Cut pieces to the necessary length, adding two to three inches to allow for trimming.
 - When cutting Bulletin Board, first score the material using a utility knife. Finish the cut using a hook knife held at an angle to the face of the material so that the edge has a slight undercut.
 - Trim a minimum of 1/2" from the factory edge when seaming.
 - Use reference marks for proper alignment of sheets on the wall.
 - Reverse roll (roll face in) each piece prior to installation in order to remove the "roll curl". Massage out any remaining roll curl at the ends of each piece to ensure that the material will lay flat when placed into the adhesive.
 - Make sure the jute backing is free of any debris or foreign material before placing the Bulletin Board into the adhesive.
 - Install one sheet at a time. For non-porous substrates a short open time may be appropriate in order to allow the adhesive to develop body before placing the material into the adhesive, but **DO NOT ALLOW THE ADHESIVE TO DRY**. For porous substrates, no open time is necessary before placing the material into the adhesive. The 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. The 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 will enable the material to remain in contact with the adhesive.
- Note:** The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary.
- After adhering, immediately roll the Bulletin Board in both directions to remove any trapped air and to firmly press the material into the wet adhesive.
 - Use the Forbo Seam & Strip Cutter for cutting seams, or under scribe the seams being sure to cut the edges with a slight undercut. Refer to the Installation section elsewhere in this guide for additional information.
 - Remove adhesive residue immediately with a clean white damp cloth. Dried adhesive residue can be removed with a clean white cloth and mineral spirits.
- Caution:** Aggressive cleaning may mar the Bulletin Board surface. The need for aggressive cleaning can be avoided by taking care to keep the surface clean while handling and adhering the sheets.

Care and Cleaning Fast Facts

- Dust regularly or, if necessary, wipe with a clean white damp cloth.
- For stubborn soil, **gently** clean the surface using a **soft** bristle brush and lukewarm water with a neutral pH detergent. Remove the cleaning solution with a squeegee and cloth. Rinse with clean water and remove any remaining water with a squeegee and cloth.

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Installation Fast Facts: Marmoleum® Wainscot

GAUGE: 1/10" (2.5 mm)
 WIDTH: 79" (2 M)
 LENGTH: 105' (32 M)



Transparent.
 Quantified.
 Global.

Installation Fast Facts

- Forbo Marmoleum® sheet may be installed on approved substrates that are sound, smooth, rigid, flat, dry, clean, and free of all foreign materials such as, dust, grease, oils, solvents, sealers, and old adhesive residue.
- Areas to receive material should be clean, fully enclosed and weathertight. The permanent HVAC should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- 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 specific site conditions and potential bonding problems.
- Use Forbo L 910W adhesive.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive. Be sure to hold the trowel at approximately a 60° angle to the wall to ensure that the proper amount of adhesive is applied.
- Do not mix material from different batches/dye lots. Install rolls and cuts in consecutive order. Do Not Reverse sheets for seaming.
- Use reference marks for proper alignment of sheets on the wall.
- Reverse roll (roll face in) each piece prior to installation in order to remove the "roll curl". Massage out any remaining roll curl at the ends of each piece to ensure that the material will lay flat when placed into the adhesive.
- Make sure the jute backing is free of any debris or foreign material before placing the Marmoleum® into the adhesive.
- Install one sheet at a time. For non-porous substrates a short open time may be appropriate in order to allow the adhesive to develop body before placing the material into the adhesive, but **DO NOT ALLOW THE ADHESIVE TO DRY**. For porous substrates, no open time is necessary before placing the material into the adhesive. The 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. The 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 will enable the material to remain in contact with the adhesive.
- **Note:** The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary.
- After adhering, immediately roll the Marmoleum® in both directions to remove any trapped air and to firmly press the material into the wet adhesive.
- Use the Forbo Seam & Strip Cutter for cutting seams, or under scribe the seams being sure to cut the edges with a slight undercut. Refer to the Installation section elsewhere in this guide for additional information.
- Remove adhesive residue immediately with a clean white damp cloth. Dried adhesive residue can be removed with a clean white cloth and mineral spirits.
- A natural phenomenon occurs in linoleum products that is commonly referred to as "drying room yellowing". During the time the Marmoleum® is curing in the drying room, a yellowish cast may appear on the surface of the material. **This is normal and is NOT a product defect.** This yellow cast will disappear when the Marmoleum® is exposed to light, either natural or artificial. The rate at which drying room yellowing will disappear may vary from a few hours to a few weeks, depending on the type and intensity of the light source.

Care and Cleaning Fast Facts

- Dust regularly or, if necessary, wipe with a clean white damp cloth.
- For stubborn soil, use lukewarm water with a neutral pH detergent. Remove the cleaning solution and rinse with clean water.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: Marmoleum® Wall Panels

GAUGE: 0.36" (9.1 mm)
 PANEL SIZES: 38" x 96" (For use where material will run horizontally)
 48" x 78" (For use where material will run vertically)



Installation Fast Facts

- Forbo Marmoleum® Wall Panels may be installed on approved substrates that are sound, smooth, rigid, flat, dry, clean, and free of all foreign materials such as, dust, grease, oils, solvents, sealers, and old adhesive residue.
- Areas to receive material should be clean, fully enclosed and weathertight. The permanent HVAC should 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 following the installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation.
- Marmoleum® Wall Panels should always be stored flat.
- 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 specific site conditions and potential bonding problems.
- Use a quality construction adhesive.
- Apply a 1/4" - 3/8" bead of quality construction adhesive to the wall 1" - 2" away from the edge around the perimeter of the area where the panel is to be installed, and vertically 18" - 20" on center in the middle of the area.
- Place the panel into position and rub or roll firmly to ensure the panel is pressed completely into the adhesive.
- Immediately pull the panel away from the wall and then back again. This will allow the adhesive to flash off and also enable the identification of any areas that the panel was not in full contact with the adhesive.
- Clean any adhesive on the face of the panel immediately using a clean white cloth dampened with mineral spirits. Remove any residue of mineral spirits with a clean white cloth dampened with water and dishwashing detergent.
- Use 6d finish nails to temporarily hold the panel in position while the adhesive is drying. The nails should be placed in areas that will be covered later by molding whenever possible.
Note: If the hole will not be covered, a matching filler can be made by sanding or scraping the surface of a scrap piece of panel to produce a powder of the Marmoleum® material. This powder can then be mixed with a white glue to create a color-matched paste that can be used to fill any exposed nail holes. Refer to the Repairs section elsewhere in this guide for additional information.
- Continue this process for each panel along the wall, placing the connector "T" molding between each panel as the work progresses.
- Starting with the first panel on the adjacent wall, adhere the inside corner molding to the panel before adhering the panel to the wall.
- Continue this process until the installation is complete. Refer to the Installation section elsewhere in this guide for additional information.
- A natural phenomenon occurs in linoleum products that is commonly referred to as "drying room yellowing". During the time the Marmoleum® is curing in the drying room, a yellowish cast may appear on the surface of the material. **This is normal and is NOT a product defect.** This yellow cast will disappear when the Marmoleum® is exposed to light, either natural or artificial. The rate at which drying room yellowing will disappear may vary from a few hours to a few weeks, depending on the type and intensity of the light source.

Care and Cleaning Fast Facts

- Dust regularly or, if necessary, wipe with a clean white damp cloth.
- For stubborn soil, use lukewarm water with a neutral pH detergent. Remove the cleaning solution and rinse with clean water.

» Any questions regarding the quality of the material should be addressed prior to installation «

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Installation Fast Facts: Forbo Wall Base

| | |
|------------|-------------------------|
| GAUGE: | 1/8" |
| HEIGHT: | 4" or 6" |
| STYLE: | Cove or Straight |
| PACKAGING: | 4": 120 feet per carton |
| | 6": 96 feet per carton |

Installation Fast Facts

- Forbo Wall Base may be installed on approved substrates on all grade levels.
- Areas to receive material 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 environment for at least 24 hours prior to the installation. Areas to receive material shall be adequately lighted to allow for proper installation and for final inspection.
- The wall surface must be thoroughly dry, smooth and free from dirt, wallpaper, vinyl wall covering, grease, old adhesives and other contaminants that could interfere with the adhesive bond. Vinyl wall coverings should extend no more than 1/4" below the top of the base.
- 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.
- 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.
- **Forbo's Limited Warranty covers manufacturing defects only. Additional 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.**
- Use a quality acrylic wall base adhesive.
- Use a V notch spreader, or if using cartridges, a three-hole nozzle for 4" base and a five-hole nozzle for 6" base.
- Apply the adhesive to the wall or to the back of the base. In order to avoid excess adhesive at the top of the base, apply the adhesive no closer than 1/4" to the top of the base if using a spreader, or 1" if using cartridges.
- Install the base within 20 minutes of adhesive application.
- If the wall or floor surface is uneven, it may be necessary to trim the edges of adjoining pieces before installing so that a tight joint can be achieved. Use a razor type utility knife and cut the base from the face side.
- Immediately after installation, roll the base with a hand roller to ensure that proper adhesive transfer is achieved. If a hand roller is unavailable, firmly press the base into the adhesive using a clean, soft cloth dampened with water.
- Roll or rub the base in the opposite direction of installation to avoid stretching the base. Refer to the Installation section elsewhere in this guide for additional information.

Care and Cleaning Fast Facts

- Forbo Wall Base is maintained by hand. Clean with a wet cloth or wet mop and a neutral cleaner.
- Rinse with clear water. Clean Forbo Wall Base as conditions and soiling dictates.

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Installation Fast Facts: Forbo Installation Accessories

LENGTH: 12 feet*

WIDTH: Varies

PACKAGING: 20 pieces per carton (240 linear feet)*

*Tile reducer strip is available in 3 foot length only and is packaged 50 pieces per carton (150 linear feet).

Installation Fast Facts

- Forbo Installation Accessories may be installed on approved substrates on all grade levels.
- Areas to receive material 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 environment for at least 24 hours prior to the installation. Areas to receive material shall be adequately lighted to allow for proper installation and for final inspection.
- The substrate must be sound, smooth, permanently dry and free from dirt, grease, old adhesives and other contaminants that could interfere with the adhesive bond.
- 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.
- 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.
- **Forbo's Limited Warranty covers manufacturing defects only. Additional 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.**
- Use a premium brush grade contact adhesive.
- Measure the length of transition needed and cut with a sharp knife.
- Apply the contact cement to both surfaces. The contact cement should be brush applied uniformly, with complete coverage on each of the two surfaces. Take care not to get the contact cement on the face of the transition.
Note: Ensure that the area of work is well ventilated. Do not use contact cement near fire or flame and make sure that pilot lights or other ignition sources are turned off.
- Allow the contact cement to dry almost completely. The adhesive should be slightly tacky, but not transfer to the finger when lightly touched.
Note: If the two surfaces do not adhere immediately, the adhesive has likely been allowed to dry too long. In this case, re-apply another thin coat of adhesive to each surface.
- Position the transition carefully. The adhesive will grab immediately and the transition cannot be re-positioned or adjusted.
- Apply firm pressure over the entire length of the transition in order to fully seat the transition into the adhesive. Refer to the Installation section elsewhere in this guide for additional information.

Care and Cleaning Fast Facts

- Forbo Installation Accessories are maintained by hand. Clean with a wet cloth or wet mop and a neutral cleaner.
- Rinse with clear water. Clean Forbo Installation Accessories as conditions and soiling dictates.

» **Any questions regarding the quality of the material should be addressed prior to installation** «

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General Installation Guidelines

1.1 Jobsite Conditions

- Areas to receive material should be clean, fully enclosed and weathertight with the permanent HVAC in operation. A minimum temperature 68° F (20° C) shall be established at least seven days prior to beginning the installation, maintained during the installation, and for at least seven days following the installation.
- Installation should not begin until the work of all other trades has been completed, especially overhead trades.
- Areas to receive material shall be adequately lighted to allow for proper inspection of the substrate, installation, seaming and for final inspection.

1.2 Material Storage And Handling

- Areas where materials are to be stored should be a stable, conditioned environment as described under the Jobsite Conditions section of this guide. All materials and adhesives should be acclimated to these conditions for at least 48 hours prior to the installation.
- Material should be delivered to the job site in original, unopened packaging, with all labels intact.
- Store all rolls standing upright, labels up, and ensure that the color, roll and batch numbers can be easily read.
- Sheet material should always be stored and transported rolled face out on a heavy tube.
- Marmoleum® Dual Tile boxes should be stacked no more than 10 boxes high for the 20" x 20" tile or 5 boxes high for the 13" x 13" tile.
- MCT boxes should be stacked no more than 9 boxes high.
- ColoRex® SD/EC tile boxes should be stacked no more than 18 boxes high.
- Flotex® tile boxes should be stacked no more than 16 boxes high.
- Marmoleum® Wall Panels should always be stored laying flat.
- 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.

1.3 Color Matching

- All material should be from the same batch. Rolls or cartons must be installed in consecutive order. Cuts from individual rolls should also be installed in sequence as cut from the roll. If material from more than one batch is to be used, the job should be planned so that different batch numbers are not installed side by side.
- When installing Marmoleum® sheet products, all sheets must be installed running in the same direction.
- All Forbo sheet vinyl products must be installed with adjacent sheets reversed except Eternal Wood. Eternal Wood must be installed with all sheets running in the same direction.
- When installing Flotex® sheet products, all sheet must be installed running in the same direction.
- Color and shade match for all Forbo sheet flooring products is guaranteed only when seaming the trimmed factory edge to trimmed factory edge with the sheets oriented in the recommended direction.
Note: When installing Flotex® sheet products, butt the factory edges for seaming.
- Marmoleum® Dual Tile and MCT has a directional pattern and should be installed in alternating directions (quarter turned).
- ColoRex® SD/EC tile has a directional pattern and must be installed with arrows running in the same direction.
- Flotex® tile has a directional pattern and should be installed with arrows running in alternating directions (quarter turned). Certain patterns may be installed with arrows running in the same direction.

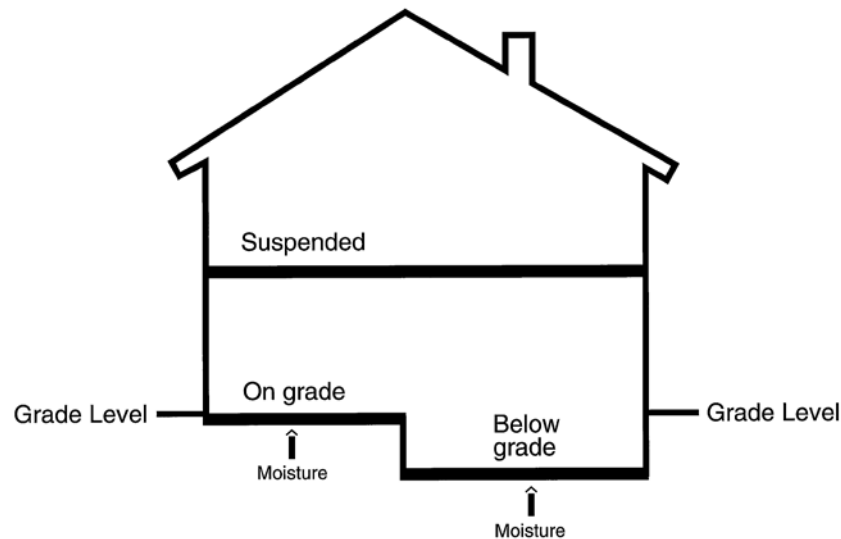
1.4 Third Party Products

- Forbo does not approve nor disapprove of any third party products that may be used in the course of a flooring installation. Such products are manufactured by others and their performance is beyond Forbo's control. Any warranty for their performance is the responsibility of that manufacturer. Forbo does not test or evaluate products manufactured by others for performance, compatibility or any other quality. Any inquiries of that nature should be directed to the manufacturer of the product.
- It is the user's responsibility to investigate and research the performance characteristics and warranty information for any product being considered for use.
- Any mention in this manual of products not manufactured or supplied by Forbo does not constitute any endorsement or warranty of those products by Forbo. Any such mention of third party products is intended for the sole purpose of establishing a comparative standard of quality and should not be interpreted as suggesting that those products are the only products suitable for a particular purpose. There may be other third party products available that are equally suitable.

Substrate Evaluation and Preparation

No floor covering can be any better than the substrate over which it is installed. The finished appearance and performance of the material will be determined and affected by the condition of the substrate. It is essential that all substrates be structurally sound, rigid, smooth, flat, clean, and permanently dry. The substrate must be 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. Substrate evaluation and preparation should not begin until a stable, conditioned environment has been established as described under the Jobsite Conditions section of this guide.

NOTE: The results of moisture testing, pH testing, and adhesive bond testing are directly influenced by the environment in which the tests are conducted. Results of tests conducted prior to establishing a stable, conditioned interior environment should not be relied upon for determining if suitable conditions exist for installation. Changes in the interior environment subsequent to such testing may cause conditions to change and lead to installation failures.



2.1 Definitions

Grade Levels: (Refer to ASTM F 141.)

On Grade – A location for a finished floor with no portion below ground level, and with the floor and the ground in contact or separated by less than 18” of well-ventilated space between the bottom of the lowest horizontal structural member and the ground at any point.

Above Grade (Suspended) – A location for a finished floor where the floor is not in contact with the ground and which provides at least 18” of well-ventilated space between the bottom of the lowest horizontal structural member and the ground at any point.

Below Grade – A location for a floor structure which is in contact with the ground or with less than 18” of well-ventilated space between the bottom of the lowest horizontal structural member and the ground, at any point and if part or all of the floor is below ground level.

Subfloor – That structural layer intended to provide support for design loadings which may receive resilient floor coverings directly if the surface is suitable or indirectly via an underlayment if its surface is not suitable.

Underlayment – The layer of material installed on or over the subfloor to provide a smooth, clean surface to receive the resilient floor covering.

Substrate – The underlying support surface upon which the flooring is directly installed.

Subfloor–Underlayment Combination – Designed to meet both the structural requirements and to provide a smooth surface to receive the floor covering.

Note: Subfloor–Underlayment Combinations are usually only suitable for the installation of textile type floor coverings. For resilient floor coverings, underlayment should be installed.

Flooring System – All components associated with the installation of flooring materials including, but not limited to, subfloors, substrates, patching and leveling materials, primers or other coatings, moisture control products, adhesives, and finish flooring materials.

Substrate Evaluation and Preparation

2.2 Substrate Evaluation

2.2.1 Concrete Substrates (Refer to ASTM F 710.)

Concrete substrates shall be structurally sound, rigid, smooth, flat, clean, and permanently dry. The concrete surface must be 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.

Concrete substrates shall have a minimum compressive strength of 3,000 psi and a dry density of at least 150 pounds per cubic foot.

Concrete substrates on or below grade are required to have an effective moisture vapor retarder installed directly below the slab. The vapor retarder shall be puncture and tear resistant with a minimum thickness of 0.010" and a permeance of 0.1 y. (Refer to ASTM E 1745.)

If no vapor retarder is present, or for additional information, contact Forbo Technical Services.

Imperfections such as chips, spills, cracks, and joints must be repaired using suitable patching and leveling materials. Always follow the manufacturer's recommendations for the use and application of these products. Refer to the Substrate Preparation section of this guide for additional information.

Concrete Joints

Expansion and Isolation Joints - Expansion and isolation joints in concrete are designed to allow for the expansion and contraction of the concrete. All movable joints must be honored in order to eliminate buckling and telegraphing in the finished resilient flooring caused by movement in the concrete. Expansion joint covers designed for use with resilient floorings must be used at all movable joints.

Construction and Control Joints (Saw Cuts) - All such non-moving joints should be prepared using suitable fillers and/or patching and leveling materials. Always follow the manufacturer's recommendations for the use and application of these products. Refer to the Substrate Preparation section of this guide for additional information.

Note: If movement in the concrete and/or moisture coming from the joint subsequent to the installation of resilient flooring materials causes buckling of the flooring material or telegraphing of the joint, it is a structural or site related condition. Any such damage resulting from those conditions is not covered under Forbo's warranty. Having the areas to receive floor coverings conditioned as described under the Jobsite Conditions section of this guide will reduce the potential for such occurrences.

It may be difficult to determine if curing compounds, hardening compounds, and/or sealers have been used. Always conduct adhesive bond tests prior to the installation to ensure the integrity of the flooring system, and to ensure that a secure bond can be achieved.

2.2.2 Wood Substrates (Refer to ASTM F 1482.)

Wood substrates shall be structurally sound, rigid, smooth, flat, clean, and permanently dry. The wood surface must be 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.

Wood substrates should be double construction with a minimum total thickness of 1". All wood substrates must have at least 18" of well-ventilated air space below.

Forbo floor coverings should not be installed over wooden substrates built on sleepers over on or below grade concrete floors without first making sure that adequate precautions have been taken to ensure the structural integrity of the system and to prevent moisture migration from the concrete slab. Proper planning and design will minimize the potential for flooring system failures generally associated with this type of construction.

Strip Wood/Plank Flooring

Because of the expansion and contraction of strip and plank flooring during seasonal changes, 1/4" or thicker underlayment panels must be installed over these types of floors.

Underlayment Panels

Underlayment panels are used to correct deficiencies in the subfloor and to provide a smooth, sound surface on which to adhere resilient flooring. Underlayment panels should be acclimated to site conditions as prescribed by the manufacturer. In lieu of specific recommendations, acclimate panels for a minimum of 48 hours prior to installation.

Underlayment panels should be a minimum of 1/4" in thickness, of underlayment grade with one fully sanded face, and recommended for use as underlayment for fully adhered resilient flooring (APA Underlayment Grade plywood or equal). Underlayment panels must be free of any foreign material that may prohibit a secure bond or cause the discoloration of resilient flooring, including, but not limited to, adhesives, sealers, inks, solvents, etc.

Always follow the panel manufacturer's recommendations for panel installation and preparation. In lieu of specific installation recommendations, successful panel installation may be accomplished as follows:

Using narrow crown, divergent point staples that will not extend completely through the subfloor, begin fastening the panel in one corner and proceed in a fan pattern across the panel. Place staples 4" - 6" apart in the middle of the panel and 2" - 3" apart at the panel edges.

Staples should be no closer than 3/8" from the panel edge. Panels should be lightly butted, with no pressure. After fastening, sand all panel joints flush.

Years of experience have identified a number of wood substrates that may cause problems when resilient flooring products are installed over them. Installation of Forbo flooring products is NOT recommended over particle board/chip board, tempered hardboard,luan plywood, fire retardant plywood, or pressure treated plywood.

Substrate Evaluation and Preparation

Always conduct adhesive bond tests prior to the installation to ensure the integrity of the flooring system and to ensure that a secure bond can be achieved.

Regardless of the type or brand of underlayment used, any problems or failures directly related to the performance of the underlayment is the responsibility of the underlayment manufacturer and/or installation contractor, and not Forbo.

Note: The use of a skim coat of patching material over wooden substrates may cause more problems than it resolves, especially in the joint areas. Moisture from patching materials will be absorbed by the wood, causing the wood fibers to swell and may cause the panel surface and/or joints to telegraph through the newly installed floor covering. Proper installation of a wooden subfloor and underlayment panels is critical to the successful installation of resilient flooring.

2.23 Existing Resilient Flooring

Forbo flooring products installed over existing resilient flooring may be more susceptible to indentation, and there is always the possibility that the existing flooring may telegraph through the new flooring.

Forbo flooring products may be installed over a single layer of non-cushioned resilient flooring provided it meets the following conditions:

1. Where existing resilient flooring is installed over concrete that is on, above and below grade, there should be no history of moisture related problems and moisture test results must not exceed the requirements of the existing resilient flooring or the product to be installed. Refer to the Moisture Testing section of this guide for additional information.
2. The substrate and underlayment must meet the requirements of the existing and the new floor covering.
3. The existing flooring must be fully adhered and well bonded.
4. The existing flooring must not be embossed or textured.
5. All cuts, gouges, dents, and other damage must be repaired with flooring material that is the same or similar to that installed, or with patching materials suitable for that purpose. Always follow manufacturer's recommendations for use and application of patching materials.
6. All waxes and finishes must be removed from the existing resilient flooring, and the surface rinsed with clean water. After cleaning, pH tests should be conducted to assure stripper residues have been removed.

The use of embossing levelers is not recommended for commercial installations.

Note: Application of a skim coat of patching material over the existing resilient flooring may cause more problems than it resolves, such as bonding failures, cracking and indentations.

Always conduct adhesive bond tests prior to the installation to ensure the integrity of the flooring system, and to ensure that a secure bond can be achieved.

The responsibility for determining if the existing resilient flooring is suitable to be installed over rests solely with the installer and flooring contractor. If there is any doubt as to its suitability, the existing flooring should be removed or an acceptable underlayment installed over it.

WARNING!

DO NOT SAND, DRY SWEEP, DRY SCRAPE, DRILL, SAW, BEADBLAST, OR MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT OR ASPHALTIC "CUT-BACK" ADHESIVES. THESE PRODUCTS MAY CONTAIN EITHER ASBESTOS FIBERS OR CRYSTALLINE SILICA. AVOID CREATING DUST. INHALATION OF SUCH DUST IS A CANCER AND RESPIRATORY TRACT HAZARD. SMOKING BY INDIVIDUALS EXPOSED TO ASBESTOS FIBERS GREATLY INCREASES THE RISK OF SERIOUS BODILY HARM. UNLESS POSITIVELY CERTAIN THAT THE PRODUCT IS A NON-ASBESTOS CONTAINING MATERIAL, YOU MUST PRESUME IT CONTAINS ASBESTOS. REGULATIONS MAY REQUIRE THAT THE MATERIAL BE TESTED TO DETERMINE ASBESTOS CONTENT. THE RCFI'S RECOMMENDED WORK PRACTICES FOR REMOVAL OF RESILIENT FLOOR COVERINGS ARE A DEFINED SET OF INSTRUCTIONS WHICH SHOULD BE FOLLOWED IF YOU MUST REMOVE EXISTING RESILIENT FLOOR COVERING STRUCTURES.

2.24 Poured Floors (Epoxy, Polymeric, Seamless)

Forbo flooring products may be installed over most poured floors provided they meet the following conditions:

1. Where poured flooring is installed over concrete that is on, above and below grade, there should be no history of moisture related problems and moisture test results must not exceed the requirements of the existing flooring or the product to be installed. Refer to the Moisture Testing section of this guide for additional information.
2. The poured floor must be totally cured and well bonded to the concrete. It must be free of any residual solvents and petroleum derivatives.
3. Loose, damaged areas and irregularities must be repaired with a patching compound suitable for that purpose. Always follow manufacturer's recommendations for use and application of patching materials.
4. The texture must be smooth. Sand or wet stone the surface to remove any grit and texture.
5. All waxes and finishes must be removed from the existing flooring, and the surface rinsed with clean water. After cleaning, pH tests should be conducted to assure stripper residues have been removed.

Always conduct adhesive bond tests prior to the installation to ensure the integrity of the flooring system, and to ensure that a secure bond can be achieved.

The responsibility for determining if the existing flooring is suitable to be installed over rests solely with the installer and flooring contractor. If there is any doubt as to its suitability, the existing flooring should be removed or an acceptable underlayment installed over it.

Substrate Evaluation and Preparation

2.25 Radiant Heated Floors

Forbo flooring products may be installed over radiant heated floors providing the maximum surface temperature of the substrate does not exceed 85°F (29°C) under any condition of use. To enable a secure bond of the adhesive to the substrate, the radiant heating system should be turned off, or the temperature lowered, for a minimum of 48 hours prior to installation of the Forbo flooring material. This is to ensure that the surface temperature of the substrate does not exceed 65° F (18° C) during the installation of the flooring material. If necessary, an alternate heating source should be used to maintain the room temperature at a minimum of 68° F (20° C) prior to, during, and for 72 hours after installation. The temperature of the radiant heating system can be increased 72 hours following the installation. When raising the floor temperature, do so gradually so that the substrate and flooring material can adapt to the temperature change together. A rapid temperature change could result in bonding problems. For additional information, contact Forbo Technical Services.

2.26 Moisture Testing

In order to ensure that the moisture condition of concrete substrates is within acceptable limits, it is essential that moisture testing be conducted on ALL concrete substrates, regardless of age or grade level, including those where resilient flooring has already been installed. Moisture testing should not be conducted unless a stable, conditioned environment as described under the Jobsite Conditions section of this guide has been established.

The environment in which the tests are conducted directly influences moisture test results. Results of tests conducted prior to establishing a stable, conditioned interior environment should not be relied upon when determining if suitable conditions exist for the installation of resilient flooring materials. Changes in the interior environment subsequent to such testing may cause concrete moisture conditions to change and lead to installation failures.

Forbo recommends conducting two types of moisture tests on concrete surfaces:

1. Calcium Chloride Moisture Vapor Emission Testing

The moisture vapor emission rate (MVER) of concrete substrates should be determined by testing conducted in accordance with ASTM F 1869. In practical terms, this test measures the rate at which moisture is evaporating from the concrete substrate. The MVER from the concrete must not exceed the requirements of the Forbo flooring product and adhesive being used.

When conducting calcium chloride moisture vapor emission tests, unreliable or incorrect test results are most often the result of:

- Tests conducted in an uncontrolled environment.
- Failure to properly prepare the concrete surface. Any potential impediment to moisture vapor emission (such as sealers, curing compounds, adhesive residue, etc.) must be completely removed prior to testing.
- An inadequate seal between the test dome and the concrete surface.
- Not using the correct formula when calculating the test results.
- Failure to properly document and report the testing data.

2. In Situ (Internal) Relative Humidity Testing

The internal relative humidity of concrete substrates should be determined by testing conducted in accordance with ASTM F 2170. In practical terms, this test measures the amount, or quantity, of moisture contained in the concrete substrate. The internal relative humidity of the concrete must not exceed the requirements of the Forbo flooring product and adhesive being used.

When conducting internal relative humidity tests, unreliable or incorrect test results are most often the result of:

- Tests conducted in an uncontrolled environment.
- Failure to ensure that the drilled hole is at the proper depth, adequately cleaned and/or that the test sleeve has been inserted properly and is adequately sealed.
- Test equipment that has not been acclimated to site conditions.
- Test equipment that is out of calibration. Test equipment should have an accuracy of +/- 3% and be calibrated on a regular basis.
- Failure to properly document and report the testing data.

As noted, these two testing methods measure different components of the overall concrete moisture condition. The more recently adopted in situ relative humidity standard is gaining favor in the floor covering industry and many consider the MVER as unimportant. It is Forbo's position however, that comprehensive evaluation enables a better understanding of the overall moisture condition of concrete substrates, and therefore enables a better informed judgment when decisions must be made.

Arguably, knowing the amount of moisture present in the concrete would have a higher priority because the potential for a moisture related failure is certainly related to the amount of moisture available to contribute to a failure.

A minimum of three tests of each type should be conducted on every job. On projects over 1,000 square feet, an additional test of each type should be conducted for each additional 1,000 square feet of area. A diagram of the area showing the location of each test and the corresponding test results should be submitted to the architect, general contractor and end user prior to the installation of the flooring material. If any test result exceeds the limitations specified, the installation SHOULD NOT PROCEED until the problem has been corrected. Installation of Forbo flooring products where moisture conditions exceed specified limits may result in partial or complete failure. Failure to honor this recommendation is an implied acceptance of site conditions by the parties involved.

Forbo recommends conducting one of the following moisture tests on gypsum surfaces:

1. Polyethylene Sheet Test

This test is performed by securing a vapor-retardant plastic sheet to the gypsum surface for a period of 72 hours. Presence of visible liquid water on the underside of the plastic sheet or the appearance of a wet or damp surface indicates that the gypsum is insufficiently dry for the application of floor coverings.

2. Surface Moisture Meter

This test is performed by using a surface moisture meter (such as Delmhorst or Tramex) to measure the relative level of moisture of the gypsum. Depending on the amount of moisture present, the meter will give a measurement ranging from "wet" to "dry."

Substrate Evaluation and Preparation

Note: These methods of testing are not designed to give quantitative information and are only used to indicate the possible presence of moisture and the need for further investigative testing. Refer back to the product manufacturer for additional information. All guidelines and recommendations from the product manufacturer should be strictly followed.

IMPORTANT: The Forbo limited warranty covers manufacturing defects only. Failures that are the direct result of circumstances beyond the control of Forbo, including substrate moisture related failures, are NOT covered under warranty. The recommendations in this guide are intended to inform the users of Forbo products about reliable installation methods and potential risks that may lead to installation failure. The purpose of this information is to provide the installer with the necessary information to best ensure a successful installation.

Moisture test results reflect the concrete moisture condition at the time of testing only. The absence of an acceptable vapor retarder under the slab, changes in the environment, or other circumstances beyond Forbo's control, may result in adverse changes in the moisture condition of the concrete subsequent to the time of testing. Forbo's warranty shall not be extended to cover damage or failures caused by moisture conditions in excess of specified limits that occur after the time of initial testing or installation.

2.27 pH Testing

It is essential that pH tests be conducted on all concrete floors regardless of the age or grade level. During the curing and drying of concrete, or whenever moisture is present and working its way through the concrete, moisture will dissolve alkali salts that are contained in the concrete. When the moisture reaches the surface of the concrete it evaporates, leaving behind an alkali salt residue on the surface. These alkali salts may cause several installation and material problems, such as adhesive failure or discoloration, shrinkage, and softening of the floor covering.

Testing the concrete pH should be done in several locations throughout the area to receive flooring. The best rule to follow is to conduct pH tests at each calcium chloride test location as the calcium chloride tests are removed.

Conduct the pH test by placing a small drop of distilled or de-ionized water on the surface of the concrete. The concrete surface should remain wet for a minimum of 60 seconds; the more porous the concrete, the larger the drop should be. Slight agitation of the surface of the concrete may be necessary to ensure that any alkaline salts have dissolved into the water. Place a full range pH test strip in the water and wait until the color stops changing. Compare the color of the test strip to the chart that comes with the test strips.

If the pH exceeds the limitation of the specified adhesive, it must be reduced prior to beginning the installation. Please refer to the Adhesive Application Chart in this guide for additional information.

Lightly abrading the surface and vacuuming up the residue will often reduce the concrete surface pH. Re-test to assure the pH has been reduced. There are also commercially available pH blockers. Check with your local flooring supply house, or in trade publications for availability of these products.

2.28 Substrate Porosity

Substrate porosity has a significant influence on the working characteristics of adhesives (open time and working time). It is important for the installer to recognize and understand this relationship so that adhesives will be used properly, especially for "wet set" installations. Where the substrate is non-porous, very porous, or if substrate porosity is not uniform, adjustments will have to be made in installation procedures to compensate. Where the substrate is non-porous or less porous, the adhesive will dry more slowly, extending the "open time" required to allow the adhesive to develop "body" before placing the material. Where the substrate is more porous, the adhesive will dry more rapidly and may require that the adhesive be applied incrementally so that the material can be placed and rolled while the adhesive is still wet enough to achieve the transfer necessary for a secure bond. It is the installer's responsibility to recognize the working characteristics of the adhesive for a given situation, and make any necessary adjustments in preparation or installation techniques that may be required to achieve a secure bond.

An easy way to determine the porosity of the substrate is to use a drinking straw or an eye-dropper of water, and place a row of water drops on the surface of the substrate. If the drops are not absorbed into the substrate within 60 seconds, the substrate should be considered non-porous.

If a concrete substrate is non-porous, a curing compound, hardener, sealer, or other bond inhibiting material may be present. Conducting an adhesive bond test will aid in identifying such contaminants.

Abrading the surface of uncontaminated, non-porous substrates may be necessary to achieve a secure bond. Primers may also be useful in improving the adhesive bond to smooth, non-porous substrates. For very porous substrates, a primer may be useful for reducing the substrate porosity and improving the working characteristics of the adhesive. A primer may also be necessary to provide a uniform porosity over surfaces where substrate porosity is inconsistent. Refer to the Primers section of this guide for additional information.

Always conduct adhesive bond tests prior to the installation to ensure the integrity of the flooring system, and to ensure that a secure bond can be achieved.

Substrate Evaluation and Preparation

2.29 Adhesive Bond Testing

Adhesive bond testing will identify most potential bonding problems and is essential for ensuring the integrity of the flooring system prior to the installation. Adhesive bond tests should be conducted using the adhesive(s) and material(s) to be used on the project after all remediation and/or preparation work has been completed. Adhesive bond tests should also be used to evaluate test areas for proposed remediation or preparation procedures.

Conduct adhesive bond tests by adhering 3' x 3' squares of material in various locations throughout the area where flooring is to be installed. The number of tests required will vary, but should be representative of evaluating the entire surface where material will be installed. Be sure to conduct tests where patching and/or leveling materials have been used, or anywhere moisture control systems or primers have been used. Allow the adhesive to dry for a minimum of 72 hours and then remove the test squares.

Interpreting the results of an adhesive bond test will vary depending on the substrate, adhesive, and the flooring material used. Generally, when using Forbo single component adhesives over standard substrates (concrete, wood, existing flooring) and following "wet set" installation recommendations, the bond failure should occur within the adhesive layer when the test sample is removed. There should be approximately the same amount of adhesive on the substrate and the material backing. If all or most of the adhesive is on the material backing, there is very likely a contaminant on the substrate. If all or most of the adhesive remains on the substrate, the adhesive most likely dried too much before placing the material, or the material was not rolled properly. If the failure occurs within or between other components of the flooring system, there may be a problem with those components.

Note: When evaluating adhesive bond tests using Forbo T 940 adhesive and Marmoleum® tiles, significant force should be required to remove the test sample, and the impression of the tile backing should be readily seen in the adhesive layer. The tile must be fully bedded in the adhesive with no significant appearance of trowel ridges.

There is no standard criteria for evaluating adhesive bond tests, but a bond test is generally considered "passed" when there is no apparent "bond failure" within any component of the flooring system, and the force required to remove the test sample is judged adequate to provide satisfactory performance of the flooring system for the intended application. For additional information, contact Forbo Technical Services.

It is the installer's responsibility to identify and correct potential bonding problems and to ensure that a satisfactory bond can be achieved prior to beginning the installation.

2.3 Substrate Preparation

Vacuuming the substrate with a commercial shop vacuum is the preferred method of removing dirt and dust. For concrete floors, damp mopping the substrate is an excellent way to remove fine dust. A clean substrate enables a secure bond between the substrate and the floor covering.

2.31 Patching and Leveling Materials (Refer to ASTM F 2419.)

There are two main categories of patching and leveling materials available in the marketplace. One category is calcium sulfate/ plaster/ gypsum base compounds, and the other is portland cement based compounds.

There are a wide range of patching and leveling materials currently available for the purpose of smoothing and patching substrate irregularities, and their quality and performance will vary. The user of such products should research performance specifications and warranties, and choose only the highest quality materials when installing Forbo flooring products. All guidelines and recommendations from the manufacturer of the product chosen should be strictly followed.

Regardless of the type or brand of patching or leveling material used, any liability for the performance of the patching or leveling material rests with the product manufacturer and/or applicator, and not Forbo.

Always conduct adhesive bond tests prior to the installation to ensure the integrity of the flooring system, and to ensure that a secure bond can be achieved.

2.32 Primers

The use of a primer may be necessary to improve adhesive bond to extremely smooth, non-porous substrates such as terrazzo, existing resilient flooring, or power troweled concrete. A primer may also be necessary to reduce the porosity of extremely porous substrates or to create a uniform porosity where spot patching has been done over a non-porous substrate.

Forbo Moisture Limitor may be used as a primer. For additional information, contact Forbo Technical Services. There are also third party products available for this purpose. Always strictly follow the manufacturer's recommendations for their use and application.

Always conduct adhesive bond tests prior to the installation to ensure the integrity of the flooring system, and to ensure that a secure bond can be achieved.

Substrate Evaluation and Preparation

2.33 Existing Adhesives

WARNING REGARDING COMPLETE ADHESIVE REMOVAL: SOME SOLVENT BASED ASPHALTIC "CUT-BACK" ADHESIVES MAY CONTAIN ASBESTOS FIBERS THAT ARE NOT READILY IDENTIFIABLE. DO NOT USE POWER DEVICES WHICH CREATE ASBESTOS DUST IN REMOVING THESE ADHESIVES. THE INHALATION OF ASBESTOS DUST MAY CAUSE ASBESTOSIS OR OTHER SERIOUS BODILY HARM. SMOKING GREATLY INCREASES THE RISK OF SERIOUS BODILY HARM.

Forbo does not recommend the use of solvents or adhesive removers to remove old adhesive residue. Any residue left within the substrate may affect the new adhesive and new floor covering. Conducting pH tests and adhesive bond tests prior to the installation will help in identifying the possible use of these materials.

Where existing asphaltic (cut-back) or other types of adhesive are present, it must be dealt with in one of three ways:

1. It may be mechanically removed by grinding, bead blasting, scarifying, etc.
2. The adhesive residue* may be encapsulated with a suitable self-leveling underlayment. Follow the self-leveling manufacturer's recommendations for intended use and application.
3. The adhesive residue* may be encapsulated with Forbo Moisture Limitor. Refer to the Moisture Limitor section of this guide for complete instructions.

* Residue is defined as residual staining that is left after all adhesive has been scraped away down to the concrete surface.

2.4 Additional Resources

2.41 Specification Requirements / Reference Documents

Reference documents for proper specification requirements are:

- ACI 302 - Guide for Concrete Floor Construction
- ASTM E 1745 - Specification for Vapor Retarders
- ASTM F 1482 - Standard Guide to Wood Underlayment Products Available for Use Under Resilient Flooring
- ASTM F 710 - Preparing Concrete Floors to Receive Resilient Flooring
- ASTM F 2419 - Installation of Thick Poured Gypsum Concrete Underlayments & Preparation of Surface to Receive Resilient Flooring

2.42 Organizations

Additional information and guidelines regarding substrates and substrate preparation can be obtained by contacting the following organizations:

APA - The Engineered Wood Association

7011 S. 19th
Tacoma, WA 98466
(253) 565-6600 / Fax: (253) 565-7265
www.apawood.org

ACI - American Concrete Institute

P.O. Box 9094
Farmington Hills, MI 48333
(248) 848-3700
www.aci-int.net

PCA - Portland Cement Association

5420 Old Orchard Rd.
Skokie, IL 60077
(847) 966-6200 / Fax: (847) 966-8389
800-868-6733
www.cement.org

RFCI - Resilient Floor Covering Institute

401 E. Jefferson Street, Suite 102
Rockville, MD 20850
(301) 340-8580
www.rfci.com

ASTM - American Society for Testing and Materials

100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
(610) 832-9585 / Fax: (610) 832-9555
www.astm.com

Adhesives

3.1 General Adhesive Guidelines

Adhesives are formulated for specific products and applications; use only Forbo adhesives for the installation of Forbo products. The adhesive should be conditioned to the jobsite in the same manner as the material. Refer to the General Installation Guidelines section of this guide for additional information. In order to achieve a successful bond, it is essential that all substrates, regardless of type, be structurally 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 carefully read and follow the instructions on the adhesive label regarding the use and application of the adhesive, and always review and follow safety and health warnings included on the label and MSDS.

Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.

For additional information, contact Forbo Technical Services.

Note: Any claim submitted to Forbo Flooring regarding bonding issues will be rejected if an adhesive not supplied by Forbo was used. The performance and compatibility of such adhesives manufactured by a third party is beyond Forbo's control. Forbo does not test or evaluate products manufactured by others for performance, compatibility or any other quality.

Adhesive Application

- "Open time" is the amount of time that the adhesive must remain exposed to the air before the flooring material can be laid into it. "Working time" is the amount of time that remains after the open time has expired to successfully complete the installation. The actual open time and working time of adhesives is determined by the ambient air temperature and humidity, the amount of air circulation, the substrate type and porosity, the working characteristics of the adhesive being used, and the trowel notch being used. Adjustments to recommended open and working times might be necessary as site conditions vary.

- A trowel is a metering device that regulates the amount of adhesive being applied. Always apply the adhesive with a trowel that has the flooring manufacturer's recommended notch for the flooring product being installed. Using the recommended trowel notch ensures that the proper amount of adhesive is applied. The use of an improperly notched trowel will apply too much or too little adhesive, and can cause bonding problems, telegraphing, indentations, and inadequate working time, all of which may result in an installation failure.

Note: For "wet set" installation of products such as Marmoleum®, inadequate adhesive transfer is the major cause of installation and floor care related problems. Applying the proper amount of adhesive (using the recommended trowel notch), paying close attention to the open and working times of the adhesive and rolling the floor covering properly with a 100 pound roller immediately after the material is laid into the adhesive are essential for achieving a secure bond and a successful installation. Rolling again before leaving the job site each day will give even greater assurance for a successful installation.

Installations in Wet Areas

- For installations where the edges of the flooring material and the adhesive may be subjected to topical water (NOT substrate moisture), Forbo 660 Polyurethane Adhesive is recommended.
- Polyurethane adhesives have little or no initial tack, are sensitive to substrate porosity, and the set up and curing is directly affected by temperature and humidity. The skill and professionalism of the installer is important when working with this type of adhesive.

Adhesives

3.2 Adhesive Descriptions

Forbo L 885 Adhesive

- Maximum concrete moisture vapor emission is 8.0 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 85%.
- A solvent free acrylic polymer adhesive recommended for use with Marmoleum®, Walton, Marmoleum® decibel, and Corkment Underlayment installed on all grade levels of concrete and approved suspended wood floors. Contains antimicrobial protection.
- Available in one gallon and four gallon pails.
- Trowel recommendation:
1/16" x 1/16" x 1/16" square notch.
- Spread rate: Approx. 150 square feet per gallon.
- Material must be installed into wet adhesive.
Open time: 0 - 15 minutes
Working time: 10 - 15 minutes
- **Note:** Times will vary depending on site conditions.
- A 1/16" x 1/16" x 1/16" square notch trowel blade is included with each 4 gallon pail.

Forbo T 940 Adhesive

- Maximum concrete moisture vapor emission is 5.0 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 75%.
- A solvent free modified acrylic polymer adhesive recommended for use with Marmoleum® Dual Tile and MCT installed on all grade levels of concrete and approved suspended wood floors. Contains antimicrobial protection.
- Available in one gallon and four gallon pails.
- Trowel recommendation:
1/16" x 1/16" x 1/16" square notch
- Spread rate: Approx. 150 square feet per gallon.
- Tile must be installed into wet adhesive.
Open time: 0 - 15 minutes
Working time: 10 - 15 minutes
- **Note:** Times will vary depending on site conditions.
- A 1/16" x 1/16" x 1/16" square notch trowel blade is included with each 4 gallon pail.

Forbo FRT 950 Adhesive

- Maximum concrete moisture vapor emission is 5.0 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 75%.
- A releasable, solvent free high quality acrylic emulsion adhesive recommended for use with Flotex® tile on all grade levels of concrete and approved suspended wood floors.
- Available in four gallon pails.
- Spread rate: Approx. 300 square feet per gallon.
- Apply with a 3/8" nap roller.
- Allow the adhesive to turn clear and dry to the touch before installing the Flotex® tiles. After turning clear, the flooring MUST be placed into the adhesive within four hours.
- **Note:** Times will vary depending on site conditions.

Forbo V 885 Adhesive

- Maximum concrete moisture vapor emission is 8.0 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 85%.
- A solvent free acrylic polymer adhesive recommended for use with Forbo vinyl sheet and ColoRex® SD/EC (non-conductive installations) installed on all grade levels of concrete and approved suspended wood floors. Contains antimicrobial protection.
- Available in four gallon pails.
- Trowel recommendation:
1/32" x 1/16" x 1/32" fine notch.
- Spread rate: Approx. 200 square feet per gallon.
- Material must be installed into semi-wet adhesive
Open time: 0 - 20 minutes
Working time: 10 - 15 minutes.
- **Note:** Times will vary depending on site conditions.
- A 1/32" x 1/16" x 1/32" fine notch trowel blade is included with each 4 gallon pail.

Forbo FRS 885 Adhesive

- Maximum concrete moisture vapor emission is 8.0 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 85%.
- A solvent free acrylic polymer adhesive recommended for use with Flotex® sheet, Coral® Entrance Flooring or Flotex® tile (permanent applications) installed on all grade levels of concrete and approved suspended wood floors. Contains antimicrobial protection.
- Available in one gallon and four gallon pails.
- Trowel recommendation:
1/16" x 1/16" x 1/16" square notch.
- Spread rate: Approx. 150 square feet per gallon.
- Material must be installed into wet adhesive.
Open time: 0 - 15 minutes
Working time: 10 - 15 minutes.
- **Note:** Times will vary depending on site conditions.
- A 1/16" x 1/16" x 1/16" square notch trowel blade is included with each 4 gallon pail.

Adhesives

Forbo 660 Polyurethane Adhesive

- Maximum concrete moisture vapor emission is 3.0 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 75%.
- A solvent free, two component adhesive for use with any Forbo floor covering in areas subjected to topical moisture, high traffic, or heavy rolling loads. Forbo 660 adhesive can be used on all grade levels of concrete, metal, and approved suspended wood floors.
- Available in 1/2 gallon, one gallon, and two gallon units.
- Trowel recommendation:
1/32" x 1/16" x 1/32" fine notch for vinyl products,
or 1/16" x 1/16" x 1/16" square notch for Marmoleum® and linoleum products.
- Spread rate: Approx. 125 - 175 square feet per gallon.
- Follow label instructions for open and working time.
Note: Times will vary depending on site conditions.
- A 1/32" x 1/16" x 1/32" fine notch trowel blade is included with each unit.

Forbo C 930 Adhesive

- Maximum concrete moisture vapor emission is 5.0 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 75%.
- A solvent free modified acrylic polymer adhesive recommended for ESD control installations of ColoRex® SD/EC on all grade levels of concrete and approved suspended wood floors. Contains antimicrobial protection.
- Available in four gallon pails.
- Trowel recommendation:
1/16" x 1/16" x 1/16" square notch
- Spread rate: Approx. 150 square feet per gallon.
- Material must be installed into semi-wet adhesive.
Open time: 0 - 20 minutes
Working time: 10 - 15 minutes
Note: Times will vary depending on site conditions.
- A 1/16" x 1/16" x 1/16" square notch trowel blade is included with each 4 gallon pail.

Forbo 615 Adhesive

- Maximum concrete moisture vapor emission is 3.5 lbs. per 1,000 square feet in 24 hours. Maximum concrete internal relative humidity is 75%.
- A solvent free modified acrylic dispersion adhesive recommended for ESD control installations of Marmoleum® Ohmex on all grade levels of concrete and approved suspended wood floors.
- Available in ten liter (2.6 gallon) units.
- Trowel recommendation:
V notch (comes with pail)
- Spread rate: Approx. 135-140 square feet per gallon.
- Material must be installed into wet adhesive.
Open time: 10 - 20 minutes
Working time: 15 - 30 minutes
Note: Times will vary depending on site conditions.
- A V-notch trowel blade is included with each unit.

Forbo L 910W Adhesive

- A solvent free modified acrylic polymer adhesive recommended for use with Bulletin Board and Marmoleum® wall applications. Contains antimicrobial protection.
- Available in one gallon and four gallon pails.
- Trowel recommendation:
1/16" x 1/16" x 1/16" square notch
- Spread rate: Approx. 150 square feet per gallon.
- Material must be installed into wet adhesive.
Open time: 0 - 15 minutes
Working time: 10 - 15 minutes
Note: Times will vary depending on site conditions.
- A 1/16" x 1/16" x 1/16" square notch trowel blade is included with each 4 gallon pail.

Note: Where the concrete moisture vapor emission exceeds any of these limitations, refer to the Moisture Limitor section of this guide for additional information.

Adhesives

3.3 Adhesive Application Chart

| Recommended for Use With | Forbo Adhesive | Adhesive Type | Packaging | Max MVE | Max RH | Max pH | Approximate Spread Rate (ft ² /gal) | Trowel Notch | Freeze/Thaw Stability |
|---|------------------|-------------------------------------|------------------------------------|-----------|--------|--------|--|--|-----------------------|
| Marmoleum [®] , Marmoleum [®] Decibel, Walton, MCS, Corkment Underlayment, Marmoleum [®] Dual Tile [‡] , MCT [‡] | L 885 | Acrylic Polymer | 1 Gallon 4 Gallon | 8 | 85% | 11 | 150 | 1/16" x 1/16" x 1/16" square notch | 5 Cycles at 0° F |
| Marmoleum [®] Dual Tile, MCT | T 940 | Acrylic Polymer | 1 Gallon 4 Gallon | 5 | 75% | 10 | 150 | 1/16" x 1/16" x 1/16" square notch | 5 Cycles at 20° F |
| Eternal (Wood, Marble, Classic, Wood Decibel, Step SR), ColoRex [®] SD/EC Tile (non-conductive applications) | V 885 | Acrylic Polymer | 4 Gallon | 8 | 85% | 11 | 200 | 1/32" x 1/16" x 1/32" fine notch | 5 Cycles at 0° F |
| Flotex [®] Sheet, Coral [®] Entrance Flooring, Flotex [®] Tile (permanent applications) | FRS 885 | Acrylic Polymer | 1 Gallon 4 Gallon | 8 | 85% | 11 | 150 | 1/16" x 1/16" x 1/16" square notch | 5 Cycles at 0° F |
| Flotex [®] Tile | FRT 950 | Acrylic Emulsion/Pressure Sensitive | 4 Gallon | 5 | 75% | 10 | 300 | 3/8" nap roller | 5 Cycles at 0° F |
| ColoRex [®] SD/EC Tile (ESD Control applications) | C 930 | Acrylic Polymer | 4 Gallon | 5 | 75% | 10 | 150 | 1/16" x 1/16" x 1/16" square notch | 5 Cycles at 20° F |
| Marmoleum [®] Ohmex | 615 | Acrylic Dispersion | 2.6 Gallon (10 Liters) | 3.5 | 75% | 10 | 135-140 | V notch (included with pail) | Do NOT Freeze |
| Bulletin Board, Marmoleum [®] Wall Applications | L 910 W | Acrylic Polymer | 1 Gallon 4 Gallon | n/a | n/a | n/a | 150 | 1/16" x 1/16" x 1/16" square notch | 5 Cycles at 20° F |
| May be used with all Forbo Flooring products as specified | 660 (2-Part) | Polyurethane | 1/2 Gallon 1 Gallon 2 Gallon | 3 | 75% | 9 | L-110-120 V-150-160 | L - 1/16" x 1/16" x 1/16" square notch V - 1/32" x 1/16" x 1/32" fine notch | Do NOT Freeze |
| ALL Forbo Adhesives | Moisture Limitor | Moisture Control Product | 4 Gallon | *8 *11 | 90% | 11 | **450 per coat | 1/8" - 3/8" nap roller | Do NOT Freeze |

[‡]Marmoleum[®] Dual Tile and MCT can be used with Forbo L 885 adhesive when the moisture levels exceed the limitations of the Forbo T 940 adhesive.

*Moisture Limitor will protect against MVE up to 8 lbs. per 1,000 square feet over 24 hours when used with Forbo T 940, C 930, FRT 950 or 660 adhesives.

*Moisture Limitor will protect against MVE up to 11 lbs. per 1,000 square feet over 24 hours when used with Forbo L 885, FRS 885, or V 885 adhesives.

**Moisture Limitor is a two-coat system. A dry film equal to 4 mils (2 coats) must be obtained in order to create a proper barrier.

Adhesives

3.4 Moisture Limitor Guidelines

- Moisture Limitor is a high solid, fast drying polymer based compound formulated to control concrete moisture conditions that are in excess of acceptable limits. Moisture Limitor will also isolate existing adhesive residue* and prevent new flooring adhesives from reactivating existing adhesives, thus eliminating discoloration and bonding problems with finish floor coverings that might occur upon reactivation of existing adhesives. Moisture Limitor will improve the adhesion of floor covering adhesives. Moisture Limitor is low in VOC's and does not contain any known hazardous materials. It is non-toxic and has ultra low odor. Moisture Limitor contains an antimicrobial that protects against mildew and fungus attack of both the wet and dry film.
- 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 72 hours before testing begins. The slab temperature must be a minimum of 55° F. The ambient relative humidity should be below 60%. These conditions should then be maintained continually during testing and application and for a minimum of 48 hours flowing application.
- Moisture Limitor can be used over concrete (all grade levels) and underlayment grade plywood.
- The substrate must be sound, smooth, clean, flat, permanently dry and free from any contaminant that would inhibit bonding of Moisture Limitor to the surface. Potential contaminants include, but are not limited to, dust, dirt, paint, grease, oils, solvents, old adhesive residue, sealers, curing and hardening compounds. Bond tests should always be conducted in order to determine that a secure bond can be achieved. When necessary, contaminants should be removed by mechanically abrading, sanding or shot blasting the surface.
WARNING! DO NOT SAND, DRY SWEEP, DRY SCRAPE, DRILL, SAW, BEADBLAST OR MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, OR ASPHALTIC "CUT-BACK" ADHESIVES. THESE PRODUCTS MAY CONTAIN EITHER ASBESTOS FIBERS OR CRYSTALLINE SILICA. AVOID CREATING DUST. INHALATION OF SUCH DUST IS A CANCER AND RESPIRATORY TRACT HAZARD. SMOKING BY INDIVIDUALS EXPOSED TO ASBESTOS FIBERS GREATLY INCREASES THE RISK OF SERIOUS BODILY HARM. UNLESS POSITIVELY CERTAIN THAT THE PRODUCT IS A NON-ASBESTOS CONTAINING MATERIAL, YOU MUST PRESUME IT CONTAINS ASBESTOS. REGULATIONS MAY REQUIRE THAT THE MATERIAL BE TESTED TO DETERMINE ASBESTOS CONTENT. THE RFCI'S RECOMMENDED WORK PRACTICES FOR REMOVAL OF RESILIENT FLOOR COVERINGS ARE A DEFINED SET OF INSTRUCTIONS WHICH SHOULD BE FOLLOWED IF YOU MUST REMOVE EXISTING RESILIENT FLOOR COVERING STRUCTURES.
- Determine the concrete moisture vapor emission rate by testing in accordance with ASTM F 1869. When applied pursuant to all manufacturers' recommendations over a properly prepared substrate, Moisture Limitor will reduce concrete moisture vapor emissions of up to 8.0 lbs. per 1,000 square feet over 24 hours when using Forbo T 940, C 930, FRT 950 or 660 adhesives or 11.0 lbs. per 1,000 square feet over 24 hours when using Forbo L 885, FRS 885 or V 885 moisture resistant adhesives. If any test result exceeds these requirements, do not use Moisture Limitor.

- Determine the internal relative humidity of the slab by testing in accordance with ASTM F 2170. If any test result exceeds 90%, do not use Moisture Limitor.
- The concrete surface pH must be tested. If the surface pH of the concrete exceeds 11, it must be reduced prior to the application of Moisture Limitor.
- Moisture Limitor will also encapsulate and prevent migration and staining from old adhesive residue* (including cutback residue*).
** Residue is defined as residual staining that is left after all adhesive has been scraped away down to the concrete surface.*

Moisture Limitor Surface Preparation

- **Concrete:** Concrete substrates must be structurally sound and have a minimum compressive strength of 3,000 psi.
Concrete Joints: Saw cuts, construction joints, etc. should be thoroughly cleaned and treated as follows prior to the application of Moisture Limitor:
 1. Using a paintbrush, thoroughly coat all surfaces of the joint or crack with Moisture Limitor to ensure that a continuous membrane will be achieved once the application of Moisture Limitor has been completed.
 2. Using a filler material intended for that purpose, fill the joint or crack to just below the surface level of the concrete so that a continuous membrane of Moisture Limitor can be achieved.

Expansion joints should not be bridged. Forbo does not warrant against film breakage due to movement of concrete joints and cracks.

- **Wood Floors:** Wood floors must be structurally sound and thoroughly secured. Forbo does not warrant against film breakage due to substrate movement.
- **Existing Adhesives:** Existing adhesives must be thoroughly scraped away leaving only a residue*. Soft adhesive residue of any kind will not support the Moisture Limitor film, and may lead to a job failure.
- **Self Leveling & Patching:** Moisture Limitor may be applied before or after the application of patching or self leveling products. Always follow the patching or self leveling manufacturers' recommendations for use of their products in combination with moisture mitigation products.
- **Porosity Testing:** Some concrete curing and sealing compounds can interfere with Moisture Limitor penetrating and mechanically bonding to the substrate surface. Testing should be done to determine if concrete floors are porous, and if there may be any sealers or curing agents present that would cause lack of adhesion. Test for porosity by putting small puddles of water one-inch across at various points over the surface of the floor. If the water substantially soaks in within 30 minutes, the floor is porous. If, after testing, it is determined that the substrate is nonporous, it may be necessary to remove the sealers or curing compounds that are causing the problem by mechanically abrading, sanding or shot blasting the surface.

Adhesive

Some very smooth concrete that has been steel troweled by mechanical means may also show to be non-porous, even if it is unsealed. These surfaces should either be acid etched with a 1% muriatic acid solution, or mechanically abraded to allow Moisture Limitor to achieve a better bond to the concrete surface. If acid etched, the concrete should be double rinsed after acid etching, and allowed to dry before applying Moisture Limitor.

- **Bond Testing:** Bond tests should always be conducted in order to determine that an adequate bond can be achieved. Moisture Limitor exhibits excellent adhesion to many hard to bond to surfaces. Because of this quality, abrading the surface of the concrete may not always be necessary, even over nonporous surfaces. This simple test will tell you if you have a bonding problem.

In several areas of the floor out of traffic lanes, apply three 2" strips of masking tape to the clean floor, overlapping them 1". Apply a roller coat application of Moisture Limitor to the floor, and run this application up onto the tape. Allow the first application to dry to the touch and then apply a second coat and allow to dry for 24 hours. After 24 hours, carefully peel the tape from the floor to the point where tape, floor, and Moisture Limitor meet. Then carefully try to peel the Moisture Limitor from the floor. If the Moisture Limitor cannot be peeled or scraped from the floor, there are no negative bonding issues. If the Moisture Limitor is not well bonded, the condition must be corrected prior to the application of Moisture Limitor. Conducting bond tests at the same time that moisture tests are being conducted will allow you to identify what the next step will be by the time moisture testing is completed.

Always conduct bond tests. Achieving a good bond is essential for a successful application of Moisture Limitor.

Moisture Limitor Application

1. Prior to application, always check the Moisture Limitor for settling. If necessary, mix until the Moisture Limitor is smooth and consistent.
2. Always apply 2 coats. Apply the Moisture Limitor with a 1/8" - 3/8" nap roller. Surface texture and porosity will determine nap size. For smooth surfaces or second coats, use a shorter nap roller; for rough or porous substrates use a thicker nap roller.
Caution: Moisture Limitor must be applied evenly and without interruption. Soft surfaces or any surface that does not support the film will result in the film being broken and subsequent failure.
3. Do not pour Moisture Limitor directly onto substrate. Use a roller pan when applying Moisture Limitor.
4. Roll in one direction with even consistent, strokes.
5. Allow the first coat to dry a minimum of 2 hours before the application of the second coat. Apply the second coat at an angle (45° - 90°) to the first coat.
6. Allow the second coat of Moisture Limitor to dry for a minimum of 24 hours, preferably 48 hours, before patching or installing flooring materials. It is not necessary to conduct additional moisture tests following application.

7. Before it has dried, clean up Moisture Limitor using soap and water. Dried Moisture Limitor must be scraped or abraded.
8. If the application of Moisture Limitor cannot be completed in one day, overlap the transition by 2' along the seams. DO NOT abrade, scour, or deface the underlying Moisture Limitor before overlapping the seams.
9. If the completed Moisture Limitor film becomes damaged, it must be repaired. If the flaw is akin to a mark caused by a dropped tool, assess the damage. If it is mild, then recoat pursuant to instructions, extending out 2' from the affected area. If the damage is more extensive, then carefully remove the damaged Moisture Limitor by cutting around the affected area with a razor type blade and removing the damaged Moisture Limitor with a flat scraper. Re-apply Moisture Limitor (2 coats), overlapping the edge of the repair by 2'.

Moisture Limitor Warranty

Moisture Limitor is covered by a limited 10-year warranty only when used with Forbo flooring products and applied pursuant to all manufacturers' recommendations by a Forbo certified applicator. Forbo does not warrant the performance of Moisture Limitor when used with flooring products from other flooring manufacturers. For additional warranty information, contact Forbo Technical Services.

Moisture Limitor Specifications

- Protect from freezing. Store the Moisture Limitor indoors between 40°F and 100°F.
- Shelf Life: One year in an unopened container.
- Coverage: Approximately 450 square feet per gallon. Coverage will vary with surface porosity. A dry film equal to 4 mils (2 coats) must be obtained in order to create a proper barrier.
- Color: Milky white; dries to a clear film.
- Consistency/Viscosity: Similar to paint made for roller application.
- Non-Toxic
- Non-Flammable

Installation

4.1 General Installation Guidelines

- Forbo products may be installed on approved substrates on all grade levels.
- Areas to receive material 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 Forbo sheet products standing upright. Store Forbo tile products in cartons stacked and laying flat. Store Marmoleum® Wall Panels stacked and laying flat.
- 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 the requirements of the Forbo adhesive being used. Refer to the Adhesive section for adhesive specifications. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of this 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 the requirements of the Forbo adhesive being used. Refer to the Adhesive section of this guide for adhesive specifications. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed the requirements of the Forbo adhesive being used. Refer to the Adhesive section of this guide for adhesive specifications.
- 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.
- Use material from the same batch/dye lot.
- Roll the material immediately and always check for proper adhesive transfer. In order to achieve a secure bond, there must be complete transfer of adhesive to the material backing.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- 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.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Underlayment Products

4.21 Installing Corkment Underlayment

- Follow all general installation guidelines prior to installing Corkment Underlayment.
 - Use Forbo L 885 adhesive.
 - Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive.
 - Install the material with the jute side upwards (exposed) and the cork surface adhered to the subfloor. Wherever possible, install the Corkment Underlayment at a right angle to the direction that the finished flooring will be installed. If the Corkment Underlayment and the finished flooring must be installed in the same direction, off-set the seams a minimum of 6".
- Note:** The thickness of the Corkment Underlayment which is applied must never be thicker than the gauge of the finished floor covering.
- After adhering, immediately roll the flooring in both directions using a 100 pound roller.
 - Cut seams for a net fit and always cut the material with a slight undercut.
 - Wait a minimum of 24 hours before installing the finished floor covering.

4.22 Installing Forbo Quickfit (MDF Underlayment Panels)

- Forbo QuickFit may be installed on approved substrates on all grade levels.
 - Areas to receive material 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 should be conditioned in the same manner for at least 24 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.
 - Always conduct moisture tests on all concrete slabs 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 3.0 lbs. per 1,000 square feet in 24 hours. 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 75%. If the moisture tests exceed these requirements, please refer to the Moisture Limitor section of this guide for additional information.
 - For any areas that will exceed lengths of 33', an expansion joint must be made.
 - When installing on concrete slabs on or below grade, a laminate underlayment type vapor barrier should be used prior to installing the Forbo QuickFit.
 - When installing over wood subfloors or a raised access floor system, a laminate underlayment should be used to help improve acoustical properties of the flooring.
- Note:** When installing QuickFit over a raised access floor system, it will be a permanent installation and will no longer provide access to the panels.
- Forbo QuickFit panels are installed as a two-layer subfloor. The 3 mm panels are the first layer with the 4 mm panels as the top layer.
 - Cut the QuickFit from the top using a straight cutting blade. The panels can then be snapped on the line to remove excess material.
 - Keep a minimum of 1/4" perimeter gap between the panels and walls.
 - Starting at the shorter wall of the room, cut in half lengthwise the 3 mm panels and install along the wall with the colored adhesive side facing upwards (Figure 4.22a).
 - Install a row of full size 3 mm panels with the colored adhesive facing upwards against the first row of the cut panels with an overlap. It is ideal to install in a brick design (Figure 4.22b).
 - Place a row of full size 4 mm panels with the clear adhesive facing downwards overlapping halfway onto the second row of the cut panels.
 - Repeat the same procedures for each row until the job is completed.



Figure 4.22a

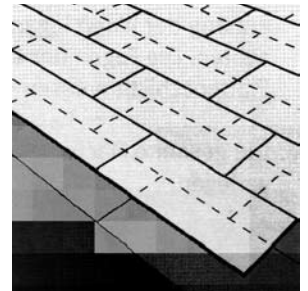


Figure 4.22b

Installation: Marmoleum® & Linoleum Sheet

4.3 Installing Marmoleum® & Linoleum Sheet Flooring

General Installation Guidelines

- Forbo Marmoleum® and linoleum sheet flooring may be installed on approved substrates on all grade levels.
- Areas to receive material 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 this 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 this 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 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.

Installation: Marmoleum® & Linoleum Sheet

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 4.3a



Figure 4.3b



Figure 4.3c



Figure 4.3d

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 4.3a).
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 4.3b). 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 4.3c). 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.
2. Begin spreading adhesive at the lap point and work back toward the wall (Figure 4.3d). 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.

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 this guide for additional information regarding adhesive open time and working time.

Installation: Marmoleum® & Linoleum Sheet

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.
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 4.3e).
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 4.3f).
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.
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.



Figure 4.3e



Figure 4.3f

Installation: Marmoleum® & Linoleum Sheet

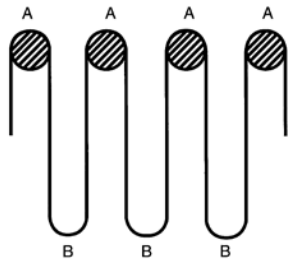


Figure 4.3g



Figure 4.3h



Figure 4.3i

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 4.3g, part A), known as a pole mark, is cut off and recycled. The bottom of each loop (Figure 4.3g, part B) is called a “stove bar mark” and will appear approximately in the center of each roll (Figure 4.3h). 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 4.3i) 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.

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.

4.31 Installing & Grounding Marmoleum® Ohmex

When installing Marmoleum® Ohmex, follow the same subfloor preparation and installation recommendations as for all other linoleum sheet installations. The conductive adhesive and grounding procedures are unique to Marmoleum® Ohmex. Refer to the Adhesives section of this guide for additional information on Forbo 615 adhesive. Excessively low ambient relative humidity can encourage increased static buildup on surfaces. In rooms or environments designed for static dissipative qualities, ambient conditions should be maintained at a relative humidity of 50% with a +/- 10% margin.

Grounding Procedures for Installations of 500 Square Feet or Less:

Install the grounding strap into wet adhesive the entire width of the room running crosswise to the direction of the Marmoleum® Ohmex sheets (Figure 4.31a). Spread additional adhesive on top of the strap and install the material over it.

Grounding Procedures for Installations of 500 Square Feet or Greater:

At 20 foot intervals, install the grounding strap into wet adhesive the entire width of the room running crosswise to the direction of the Marmoleum® Ohmex sheets. At the side walls, run the grounding strap perpendicular and overlapping the other straps running the entire length of room, leaving enough additional grounding strap to run up the wall and connect to the building ground (Figure 4.31b). Spread additional adhesive on top of the strap and install the material over it.

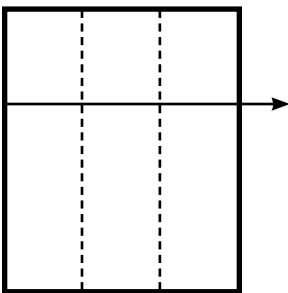


Figure 4.31a

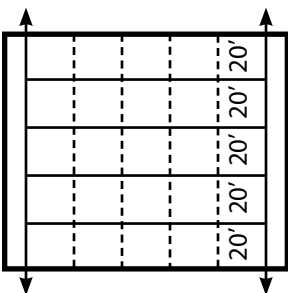


Figure 4.31b

Installation: Vinyl Sheet

4.4 Installing Vinyl Sheet Flooring

General Installation Guidelines

- Forbo vinyl sheet flooring may be installed on approved substrates on all grade levels.
- Areas to receive material 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 Forbo vinyl 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 V 885 adhesive. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of this 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 V 885 adhesive. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 11 when using Forbo V 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 V 885 adhesive.
- Use a 1/32" x 1/16" x 1/32" fine 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 when installing Eternal Wood and Eternal Wood decibel. Reverse sheets for seaming when installing all other Eternal products.
- 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 complete transfer of adhesive to the material backing.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Forbo sheet vinyl flooring products have a glass fiber interlayer which gives them their dimensional stability. These materials will not shrink or compress. If cut too full or back rolled, it will result in a bubble.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Vinyl Sheet

Cutting and Fitting the Sheets

Forbo recommends that vinyl sheet flooring be cut and fit one sheet at a time. Forbo vinyl sheet products are flexible and easy to handle. In most cases, a qualified installer will be able to hand fit the material in areas where base or trim moldings will be installed after the installation is completed. Following these recommendations will give the installer the best opportunity to manage the open time and working time of the adhesive and ensure that the flooring material is placed into semi-wet adhesive.

Note: Because of the abrasive qualities of the metalized carborundum chips in the Eternal Step SR, knife blades will have a very short life.

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 off of the roll, adding approximately 2" - 3" for extra trimming at each end.
3. Push the length of the sheet as close to the starting wall as possible, letting the extra length run up the wall at each end.
4. Starting at the main (long) wall, set the scribes to a minimum of 3/8" more than the greatest distance between the wall and the flooring material. Scribe the shape of the wall onto the flooring material. Cut the material along the scribe line using a hooked blade knife (Figure 4.4a).



Figure 4.4a

5. Position the fitted sheet in place against the main wall.
6. 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 4.4b). In lieu of the Forbo Seam & Strip Cutter, a straight edge, utility knife and hooked blade 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.



Figure 4.4b

7. Cut the required length for the second sheet off of the roll, adding approximately 2" - 3" for extra trimming at each end.

Note: Do Not Reverse sheets for seaming when installing Eternal Wood and Eternal Wood decibel. Reverse sheets for seaming when installing all other Eternal products

8. Position the second sheet with a 1/2" - 1" overlap over the first sheet at the seam.
9. Repeat these steps for as many sheets necessary to complete the job or as many sheets that can be installed that day.
10. Lap half way back all overlapped sheets as one. **DO NOT BACK ROLL VINYL BACKED FLOOR COVERINGS.**
11. Draw a pencil line along the area where the adhesive will be spread to assure an even and straight line of adhesive. Spread the adhesive over the entire area. Be careful not to leave any adhesive ridges or puddles. For 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be **transfer** of adhesive to the material backing in order to achieve a secure bond.



Figure 4.4c

12. Push the lapped flooring from the fold into the adhesive one sheet at a time, working towards the wall. **DO NOT FLOP THE MATERIAL INTO THE ADHESIVE.** This will trap air under the material causing bubbles.
13. 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.
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.
14. After the material has been laid into the adhesive, underscribe the seams using the short scribes with either the scribe blade or scribe pin (Figure 4.4c).
Note: Set the scribes so that the seam will have a slight gap, about half the thickness of a razor blade. If the material is cut too full, it will result in bubbles or ridges.
15. Cut the material along the scribe line with a hooked blade knife.
16. Roll the seam with a hand roller.
17. Repeat the same procedure on the other half of the sheet until the job is completed. Take caution not to overlap adhesive lines or leave ridges of adhesive, as it may telegraph through the material.
18. The seams should be heat welded no sooner than the day following installation. Refer to the Heat Welding section of this guide for complete instructions.

Installation: Flotex® Sheet

4.5 Installing Flotex® Sheet Flooring

General Installation Guidelines

- Flotex® sheet flooring may be installed on approved substrates on all grade levels.
- Areas to receive material 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 environment 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 Flotex® rolls standing upright.
Note: Storing the rolls laying down will result in pile crush. Forbo will not honor claims relating to pile crush if the rolls were stored laying down.
- 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 FRS 885 adhesive. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of this 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 FRS 885 adhesive. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 11 when using Forbo FRS 885 adhesive.
- Always conduct adhesive mat bond tests before beginning the installation. Bond testing will aid in determining the proper working time of the adhesive and help to identify bonding problems prior to the installation.
- 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 FRS 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 and cuts in consecutive order.** Forbo will not honor shading claims where the Forbo Flotex® sheet has been installed out of sequence.
- Do Not Reverse sheets for seaming. Install with arrows all pointing in the same direction.
- Install sheets running lengthwise in corridors.
- Butt factory edges for seaming.
- Roll immediately with a 75 pound three-section roller and always check for proper adhesive transfer. In order to achieve a secure bond there must be complete transfer of adhesive to the material backing.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Mixing Flotex® sheet and Flotex® tile products in the same area is not recommended. This is especially important when installing borders or motifs. The Flotex® tile is thicker than the Flotex® sheet material and may wear or become damaged when mixed with the sheet material.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Flotex® Sheet

Cutting and Fitting the Sheets

1. Prior to cutting, organize the material by roll number to ensure that the rolls and cuts will be installed in consecutive order. Make sure that all rolls are from the same batch/lot.
2. Whenever possible, run the arrows toward the main light source.
3. Unroll the material and cut the individual pieces to length, making sure to allow for pattern match and trimming. Do Not Reverse sheets. Run all arrows in the same direction.
Note: When Installing Flotex® sheet in corridors, always run arrows lengthwise. Where corridors intersect, it is recommended that a decorative border be used as a separator to avoid pattern cross match at the intersection.
4. Dry lay the pieces, butting the factory edges for seaming. Make sure that the seam edges come together with a net fit with no fullness or gaps.
Note: For cross seams or fills that are not pre-trimmed, straight edge the material from the face. Hold the knife blade at a right angle to the face of the material.

Adhering the Sheets

1. After dry laying the area, carefully roll each sheet back approximately half way. Take care that the sheets do not shift during handling. Mark the edge of the first sheet with a pencil line before rolling back.
2. Snap a chalk line as a spread line in front of where the material is folded over to assure an even and straight line of adhesive.
3. Spread adhesive on the exposed substrate. Take care not to leave ridges or puddles.
4. For 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be transfer of adhesive to the material backing in order to achieve a secure bond.
Note: The open time and working time of adhesives will vary depending on site conditions such as ambient temperature and humidity, the porosity of the substrate and air circulation. It is the installer's responsibility to make adjustments to specific conditions as may be necessary. Refer to the Adhesives section of this guide for additional information regarding adhesive open time and working time. The material must be placed into semi-wet adhesive.
5. Carefully place the Flotex® sheet into the adhesive one at a time, starting with the first sheet and carefully follow the pencil line. Smooth the seams into place using a spatula.
Note: Do Not Use a stretcher or knee kicker on Flotex® sheet.
6. Roll the material with a 75 pound three-section roller.
7. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
8. Trim the excess material at doorways and walls using a carpet knife or edge trimmer with a hooked blade, and use a spatula to press the Flotex® firmly into the adhesive after trimming. Be sure to complete all trimming before the adhesive working time has expired.
9. Repeat this sequence for the other half of the area.

Decorative Inlays

1. Lay and adhere all field areas in the room following the guidelines outlined in these instructions.
2. Measure out the locations for the decorative inlays. Mark off the inlay locations with white chalk.
3. Place a cutting guide in position along the chalk lines and cut the field piece along the lines.
4. Remove the cut field piece and scrape any ridges that may remain from the original adhesive.
5. Cut the inlay piece to fit, re-apply adhesive and place the inlay into position.
6. Using a spatula, press the inlay firmly into place.
7. Roll the completed inlays with a 75 pound three-section roller.

Decorative Borders

1. Snap chalk lines around the area where the field material will stop, making sure to allow for trimming the border material.
2. Lay the field material so that it extends slightly over the chalk lines.
3. Using the chalk lines as a spread line, adhere all field areas in the room following the guidelines outlined in these instructions.
4. Using a straightedge as a guide, cut the field material along the chalk lines.
5. Apply adhesive in the area of the border and place the border material into position.
6. Using a spatula, press the border firmly into place.
7. Trim the border material at the perimeter and roll the completed installation with a 75 pound three-section roller.

Stairs

1. Flotex® CANNOT be wrapped on stairs.
2. A standard stair nosing must be used, with a separate piece of Flotex® for each tread and riser.
3. Adhere the Flotex® on the treads and risers using a high quality commercial grade contact cement following the application guidelines of the adhesive manufacturer.

Installation: Tile Products

4.6 Installing Forbo Tile Products

General Installation Guidelines

- Forbo tile products may be installed on approved substrates on all grade levels.
- Areas to receive material 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 Forbo tile products in cartons stacked and laying flat.
- 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 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo T 940, C 930 or FRT 950 adhesives or 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo L 885 or FRS 885 adhesives. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of this 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 75% when using Forbo T 940, C 930 or FRT 950 adhesives or 85% when using Forbo L 885 or FRS 885 adhesives. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 10 when using Forbo T 940, C 930 or FRT 950 adhesives or a pH of 11 when using Forbo L 885 or FRS 885 adhesives.
- 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 material from the same batch/dye lot. Mix tiles from several boxes.
- Do not remove more tile from the box than can be installed in approximately 1 hour.
- Install cartons in consecutive order.
- Install tiles in alternating directions (quarter turned).
Note: ColoRex® SD/EC has a directional pattern and must be installed with the arrows running in the same direction. Certain patterns of Flotex® tile may be installed with arrows all in the same direction.
- Install tiles into the adhesive and roll immediately. Always check for proper adhesive transfer. In order to achieve a secure bond, there must be complete transfer of adhesive to the tile backing.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Tile Products

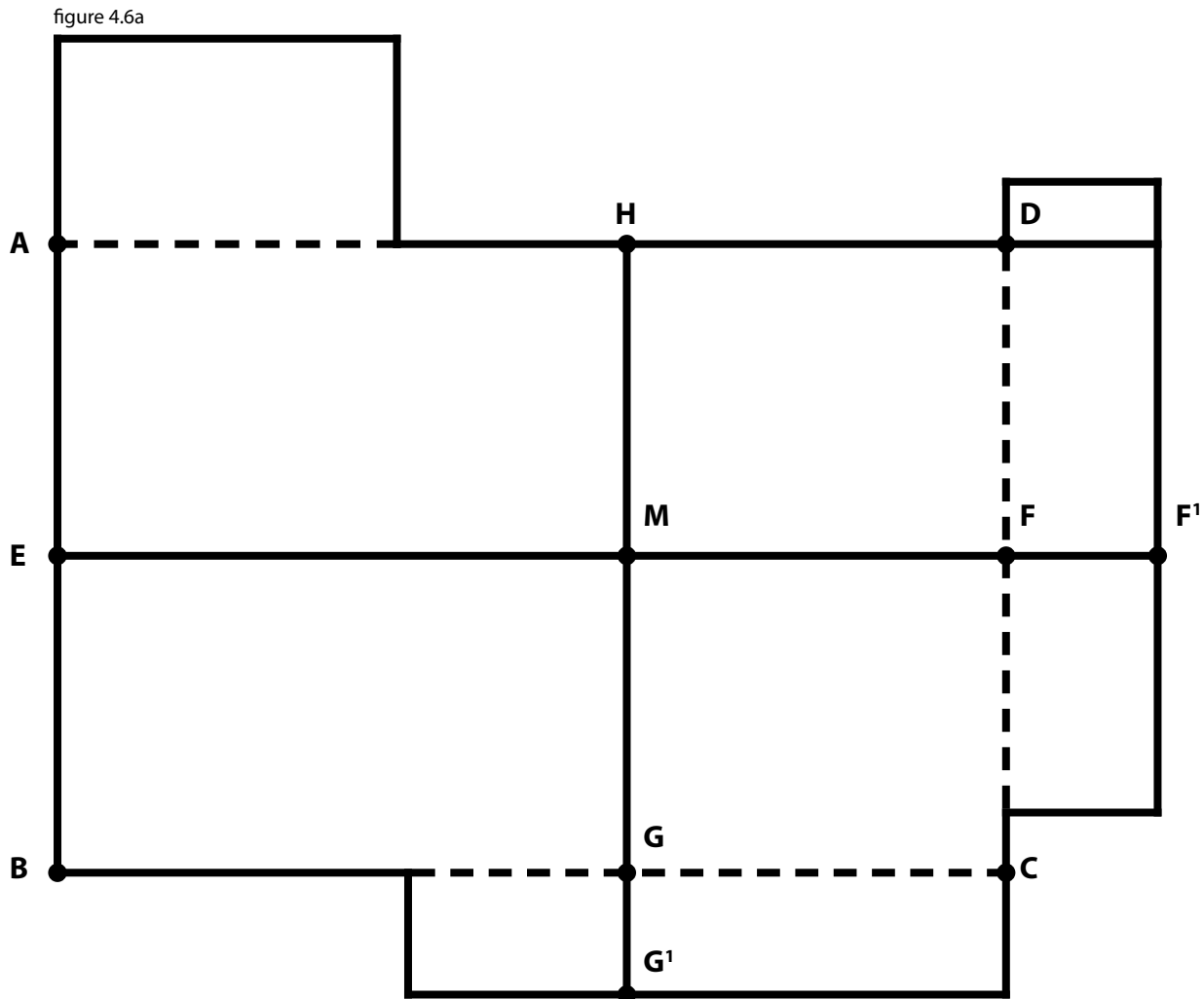
Layout

Forbo tile products are installed using conventional tile installation techniques.

It is customary to start from the center of the room. In corridors and small spaces, it may be simpler to work lengthwise from one end, using the center line as a guide.

The center line is drawn as follows: a chalk line is snapped from center of wall A-B (=E) to the center of wall C-D (=F). The center of line E-F is found (M). Draw a perpendicular line through M using the 3:4:5 method to establish G-H (Figure 4.6a).

Starting at center point M, measure out lengthwise and widthwise to the walls to make sure you will have at least a half of a tile at the border. Adjust lines E-F and G-H if necessary.



Installation: Marmoleum® Tile

4.61 Installing Marmoleum® Tile

General Installation Guidelines

- Marmoleum® Dual Tiles and Marmoleum® Composition Tiles (MCT) may be installed on approved substrates on all grade levels.
- Areas to receive material 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 environment 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® tiles in cartons stacked and laying flat.
- 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 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo T 940 adhesive or 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 this 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 75% when using Forbo T 940 adhesive or 85% when using Forbo L 885 adhesive. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 10 when using Forbo T 940 adhesive or a pH of 11 when using Forbo L 885 adhesive.
- Always conduct adhesive mat bond tests before beginning 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 T 940 adhesive. For areas with high moisture, use Forbo L 885 adhesive. For optimum performance in areas with heaving rolling loads, or for additional protection from topical moisture, Forbo 660 adhesive may be used. Please contact Forbo Technical Services for additional information on Forbo 660 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. Mix tiles from several boxes.
- Do not remove more tile from the box than can be installed in approximately 1 hour.
- Install cartons in consecutive order.
- Install tiles in alternating directions (quarter turned).
- Install tiles into wet adhesive and roll with a 100 pound roller before the adhesive has dried. Always check for proper adhesive transfer. In order to achieve a secure bond, there must be a complete **wet** transfer of adhesive to the tile backing.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Marmoleum® Tile

Adhesive Application

1. After establishing the starting lines, apply Forbo T 940 with a 1/16" x 1/16" x 1/16" square notch trowel.
2. A short open time will often be necessary to allow the adhesive to develop body. The tile **MUST** be placed into the adhesive before it has had an opportunity to dry. This enables a complete wet transfer of the proper amount of adhesive to the tile backing and is essential for a secure bond. When installing over non-porous substrates, such as existing flooring, terrazzo, etc., a longer open time may be appropriate, but **under no circumstances should the adhesive be allowed to dry before placing the tile 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.
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 this guide for additional information regarding adhesive open time and working time.
3. Immediately after placing the material into the adhesive, roll the tile in both directions using a 100 pound roller.
4. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.

Installation

1. Begin laying tiles at the starting point, ensuring that the tile is laid exactly along the layout lines. If the first few tiles are not installed accurately, the entire installation will be affected.
2. Because the tiles must be installed into wet adhesive, do not spread the adhesive in an area larger than tile can be installed while the adhesive is still wet.
3. The time it takes to mark and cut the border tiles must be taken into consideration when planning the installation. Without adequate planning, it is likely that the working time of the adhesive in the area of the border tiles will be exceeded before the tiles are installed, which will result in an inadequate bond of the border tiles. The successful installation of border tiles is best accomplished by following one of two strategies:
 - a. When laying out tile, determine the edge of a field tile a comfortable distance from each wall and then snap chalk lines around the perimeter of the room. When spreading adhesive, use these lines as a guide to stop spreading adhesive and install the field tile up to the adhesive spread lines. Once the field tiles have been installed, the border tiles can be "dry" fitted (before spreading the adhesive). After the border tiles have been cut, adhesive can be applied in the area of the border tiles and the tiles can be placed immediately into the wet adhesive.
 - b. Plan the sequence of spreading adhesive so that the border tiles can be cut and placed into the adhesive before the adhesive working time has been exceeded.
4. Immediately after installation, roll the tile with a 100 pound roller in both directions to ensure adequate transfer of adhesive to the backing. Re-roll the tile periodically to ensure that the tile remains in contact with the adhesive while the adhesive is drying.

Installation: ColoRex® SD/EC Tile

4.62 Installing ColoRex® SD/EC Tile

General Installation Guidelines

- ColoRex® SD/EC tiles may be installed on approved substrates on all grade levels.
- Areas to receive material 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 environment 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 ColoRex® SD/EC tiles in cartons stacked and laying flat.
- 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 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo C 930 adhesive or 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo V 885 adhesive. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of this 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 75% when using Forbo C 930 adhesive or 85% when using Forbo V 885 adhesive. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 10 when using Forbo C 930 adhesive or a pH of 11 when using Forbo V 885 adhesive.
- Always conduct adhesive mat bond tests before beginning 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 C 930 adhesive for conductive installations. Use Forbo V 885 adhesive for non-conductive installations. For optimum performance in areas with heavy rolling loads, or for additional protection from topical moisture, Forbo 660 adhesive may be used for non-conductive installations. Please contact Forbo Technical Services for additional information on Forbo 660 adhesive.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the adhesive when using Forbo C 930 for ESD control installations. Use a 1/32" x 1/16" x 1/32" fine notch trowel to apply the adhesive when using alternative adhesives for non-ESD control installations.
- Use material from the same batch/dye lot. Mix tiles from several boxes.
- Do not remove more tile from the box than can be installed in approximately 1 hour.
- Install cartons in consecutive order.
- Install all tiles running in the same directions.
- Install tiles into the adhesive and roll immediately. Always check for proper adhesive transfer. In order to achieve a secure bond, there must be complete transfer of adhesive to the tile backing.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: ColoRex® SD/EC Tile

Adhesive Application

1. After establishing the starting lines, apply Forbo C 930 with a 1/16" x 1/16" x 1/16" square notch trowel.
2. A short open time will often be necessary to allow the adhesive to develop body. The tile **MUST** be placed into the adhesive before it has had an opportunity to dry. This enables a complete wet transfer of the proper amount of adhesive to the tile backing and is essential for a secure bond. When installing over non-porous substrates, such as existing flooring, terrazzo, etc., a longer open time may be appropriate, but **under no circumstances should the adhesive be allowed to dry before placing the tile 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 the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be a transfer of adhesive to the material backing in order to achieve a secure bond.
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 this guide for additional information regarding adhesive open time and working time.
3. Immediately after placing the material into the adhesive, roll the tile in both directions using a 100 pound roller.
4. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.

Installation

1. Begin laying tiles at the starting point, ensuring that the tile is laid exactly along the layout lines. If the first few tiles are not installed accurately, the entire installation will be affected.
2. Because the tiles must be installed into wet adhesive, do not spread the adhesive in an area larger than tile can be installed while the adhesive is still wet.
3. The time it takes to mark and cut the border tiles must be taken into consideration when planning the installation. Without adequate planning, it is likely that the working time of the adhesive in the area of the border tiles will be exceeded before the tiles are installed, which will result in an inadequate bond of the border tiles. The successful installation of border tiles is best accomplished by following one of two strategies:
 - a. When laying out tile, determine the edge of a field tile a comfortable distance from each wall and then snap chalk lines around the perimeter of the room. When spreading adhesive, use these lines as a guide to stop spreading adhesive and install the field tile up to the adhesive spread lines. Once the field tiles have been installed, the border tiles will be "dry" fitted (before spreading the adhesive). After the border tiles have been cut, adhesive can be applied in the area of the border tiles and the tiles can be placed immediately into the wet adhesive.
 - b. Plan the sequence of spreading adhesive so that the border tiles can be cut and placed into the adhesive before the adhesive working time has been exceeded.
4. Immediately after installation, roll the tile with a 100 pound roller in both directions to ensure adequate transfer of adhesive to the backing. Re-roll the tile periodically to ensure that the tile remains in contact with the adhesive while the adhesive is drying.

Grounding

At the perimeter of the room (or at grounded steel columns) near the ground point, lay a 3' - 4' length of grounding strap into the wet adhesive, with approximately 12" extending up the wall (Figure 4.62a).

Spread additional adhesive on top of the strap and lay the tile over it.

A minimum of one grounding strap should be installed for every 2,000 square feet of uninterrupted tile.

Note: It is the floor contractor's responsibility to discuss the placement and connection of the grounding straps prior to the installation. This will aid in avoiding any controversies once the job is started.

Testing

After installation is completed, test the flooring with an ohms meter according to EOS/ESD S 7.1, ASTM F 150, or NFPA 99 (Figure 4.62b). All measurements recorded for warranty registration must be surface to ground.



Figure 4.62a

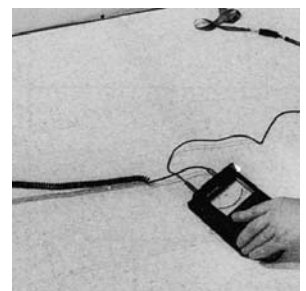


Figure 4.62b

Installation: Flotex® Tile

4.63 Installing Flotex® Tile Flooring

General Installation Guidelines

- Flotex® tile flooring may be installed on approved substrates on all grade levels.
- Areas to receive material 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 environment 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 Flotex® tiles in cartons stacked and laying flat.
Note: It is possible that during storage the pile will be compressed and may take several days to recover following installation.
- 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 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo FRT 950 adhesive or 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo FRS 885 adhesive. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of this 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 75% when using Forbo FRT 950 adhesive or 85% when using Forbo FRS 885 adhesive. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 10 when using Forbo FRT 950 adhesive or a pH of 11 when using Forbo FRS 885 adhesive.
- Always conduct adhesive mat bond tests before beginning 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 FRT 950 adhesive. Forbo FRT 950 is a releasable adhesive. For permanent applications, Forbo FRS 885 adhesive may be used. For optimum performance in areas that may need additional protection from topical moisture, Forbo 660 adhesive may be used. Please contact Forbo Technical Services for additional information.
- Use a 3/8" nap roller to apply the adhesive.
- Use material from the same batch/dye lot.
- Install Flotex® tiles with the arrows at right angles to one another (quarter turned). Ensure the direction of the arrows run in a consistent pattern throughout the installation.
Note: Certain patterns may be installed with arrows all in the same direction.
- Roll immediately with a 75 pound three-section roller and always check for proper adhesive transfer.
- Mixing Flotex® sheet and Flotex® tile products in the same area is not recommended. This is especially important when installing borders or motifs. The Flotex® tile is thicker than the Flotex® sheet material and may wear or become damaged when mixed with the sheet material.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Flotex® Tile

Adhesive Application

1. After establishing the starting lines, apply Forbo FRT 950 adhesive with a 3/8" nap roller.
2. Allow the adhesive to turn clear and dry to the touch before installing the Flotex® tiles. After turning clear, the flooring **MUST** be placed into the adhesive within four hours.

Installation

1. Beginning at the starting point and carefully following the starting lines, install the Flotex® tiles in a pyramid fashion in one quadrant of the area at a time.
2. Install Flotex® tiles with the arrows at right angles to one another (quarter turned). Ensure the direction of the arrows run in a consistent pattern throughout the installation (Figure 4.63a).

Note: Certain patterns may be installed with arrows all in the same direction.

3. Cut the perimeter tiles to size using a utility knife.
4. Roll the completed installation with a 75 pound three-section roller to ensure adhesive transfer to the Flotex® tile backing.
Note: Forbo FRT 950 is a releasable adhesive. For permanent applications, Forbo FRS 885 adhesive may be used. For optimum performance in areas that may need additional protection from topical moisture, Forbo 660 adhesive may be used. Please contact Forbo Technical Services for additional information on Forbo 660 adhesive.
5. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.

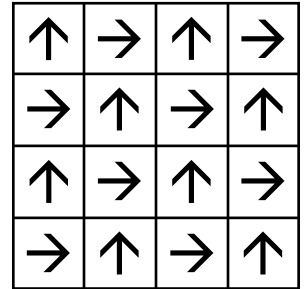


Figure 4.63a

Decorative Inlays

1. Measure out the locations for the decorative inlays. Mark off the inlay locations with chalk lines.
2. Spread the adhesive and allow it to turn clear and dry to the touch before installing Flotex® tiles. After turning clear, the flooring **MUST** be placed into the adhesive within four hours.
3. Lay the field material up to the chalk lines.
4. Cut the inlay piece to fit, then place the inlay into position.
5. Using a spatula, press the inlay firmly into place.
6. Roll the completed inlays with a 75 pound three-section roller.

Decorative Borders

1. Snap chalk lines around the area where the field material will stop, making sure to allow for trimming the border material.
2. Spread the adhesive and allow it to turn clear and dry to the touch before installing Flotex® tiles. After turning clear, the flooring **MUST** be placed into the adhesive within four hours.
3. Lay the field material so that it extends slightly over the chalk lines.
4. Adhere all field areas up to the chalk lines.
5. Using a straightedge as a guide, cut the field material along the chalk lines.
6. Place the border material into position.
7. Using a spatula, press the border firmly into place.
8. Trim the border material at the perimeter and roll the completed installation with a 75 pound three-section roller.

Stairs

1. Flotex® tiles CANNOT be wrapped on stairs.
2. A standard stair nosing must be used with separate pieces of Flotex® for each tread and riser.
3. Adhere the Flotex® on the treads and risers using a high quality commercial grade contact cement following the application guidelines of the adhesive manufacturer.

Installation: Coral® Entrance Flooring

4.7 Installing Coral® Entrance Flooring

General Installation Guidelines

- Coral® Entrance Flooring may be installed on approved substrates on all grade levels for interior applications. For exterior applications, only Coral® Grip may be installed on approved substrates.
- For interior applications, areas to receive material 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 environment 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. For exterior applications, the ambient environment should approximate the above conditions as closely as possible.
- Store Coral® rolls standing upright.
- 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 FRS 885. When moisture vapor emissions exceed these requirements, refer to the Moisture Limitor section of this 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 FRS 885 adhesive. When the internal relative humidity exceeds these requirements, refer to the Moisture Limitor section of this guide for additional information.
- The concrete surface pH must be tested and must not exceed a pH of 11 when using Forbo FRS 885 adhesive.
- Always conduct adhesive mat bond tests before beginning 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 FRS 885 adhesive. For exterior applications using only Coral® Grip, or for optimum performance in interior areas that may need additional protection from topical moisture, use Forbo 660 adhesive. Please contact Forbo Technical Services for additional information on Forbo 660 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 and cuts in consecutive order.** Forbo will not honor shading claims where Coral® entrance flooring has been installed out of sequence.
- Do Not Reverse sheets for seaming. Install with arrows all pointing in the same direction.
- Avoid seams in the middle of traffic lanes. Where seams are necessary, it is preferable to place them to the left or right of the main traffic lane.
- Roll immediately with a 75 pound three-section 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 can be removed with a clean white cloth and mineral spirits.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Coral[®] Entrance Flooring

Cutting and Fitting the Sheets

1. Prior to cutting, organize the material by roll number to ensure that the **rolls and cuts will be installed in consecutive order**. Make sure that all rolls are from the same batch/dye lot.
2. It is generally easier to work from the inside of the building toward the threshold of the entry door.
3. Unroll the material and cut the individual pieces to length, making sure to allow for final trimming. Do Not Reverse sheets. Run all arrows in the same direction. Avoid seams in the middle of traffic lanes.
4. Prepare the seam edges by cutting from the back using a straight edge and sharp knife.
5. Dry lay the pieces, butting the trimmed edges for seaming. Make sure that the seam edges come together with a net fit with no fullness or gaps.
6. Trim for final fit at the edges by cutting from the back using a straight edge and sharp knife.

Special Instructions for Coral[®] Duo Only

The direction in which the Coral[®] Duo is produced is not the traffic direction. The ribs should be running at right angles to the walking direction (Figure 4.7a).

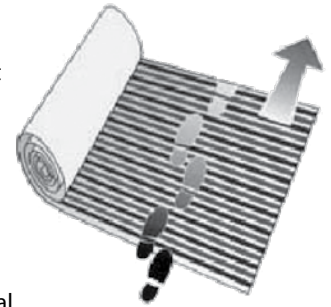


Figure 4.7a

1. Prior to cutting, organize the material by roll number to ensure that the **rolls and cuts will be installed in consecutive order**. Make sure that all rolls are from the same batch/dye lot.
2. It is generally easier to work from the inside of the building toward the threshold of the entry door.
3. Unroll the material and cut the individual pieces to length, making sure to allow for final trimming. Do Not Reverse sheets. Run all arrows in the same direction.
4. Prepare the seam edge of the first sheet by cutting off the vinyl impact edge. Cut from the back of the material using a straight edge and sharp knife.
5. Prepare the seam edge of the adjoining sheet by cutting off the vinyl impact edge plus the first rib. Cut from the back of the material using a straight edge and sharp knife. Be sure to leave the second rib intact.
6. Dry lay the pieces, butting the trimmed edges for seaming. Make sure that the seam edges come together with a net fit with no fullness or gaps.
7. Dry lay any remaining sheets, trimming any subsequent seam edges in the same manner.
8. Trim for final fit at the edges by cutting from the back of the material using a straight edge and sharp knife.

Adhering the Sheets

1. After dry fitting all of the pieces of Coral[®] Entrance Flooring, carefully lap each sheet back approximately half way. Take care that the sheets do not shift. Mark the edge of the first sheet with a pencil line before lapping back.
2. Snap a chalk line as a spread line in front of where the material is folded over to assure an even and straight line of adhesive.
3. Spread the Forbo FRS 885 adhesive on the exposed substrate. Take care not to leave ridges or puddles. If installing Coral Grip[®] for an exterior application, use Forbo 660 adhesive.
4. For 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 may be necessary in order to allow the adhesive to develop body before placing the material into the adhesive, but **DO NOT ALLOW THE ADHESIVE TO DRY**. The flooring material **MUST** always be placed into the adhesive and rolled immediately. Check for adhesive transfer frequently. There must be transfer of adhesive to the material backing in order to achieve a secure bond.
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 this guide for additional information regarding adhesive open time and working time.
5. Carefully place each sheet into the adhesive one at a time, starting with the first sheet and carefully following the pencil line. As subsequent sheets are placed into the adhesive, smooth the seams into place using a spatula.
6. Roll the area with a 75 pound three-section roller.
7. Repeat this sequence for the other half of the area.
Note: For optimum performance in interior areas that may need additional protection from topical moisture, use Forbo 660 adhesive. For additional information, contact Forbo Technical Services.
8. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.

Installation: Wall Products

4.8 Installing Forbo Wall Products

General Installation Guidelines

- Areas where Forbo wall products are to be installed 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 environment for at least 48 hours prior to the installation. Areas to receive the material shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the material, and for final inspection.
- Store all rolls standing upright.
- Forbo wall products can be successfully installed over a variety of substrates provided the surface is sound, smooth, flat, clean, and permanently dry. Drywall and wood panels are the most common substrates. For recommendations regarding other substrates, contact Forbo Technical Services.
Regardless of the specific type of substrate that is being installed over, the final determination of suitability for that purpose is the responsibility of the installer and/or installation contractor.
- Always conduct adhesive mat bond tests before beginning 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 910W adhesive with Bulletin Board and Marmoleum® Wainscot. Use a good quality construction adhesive with Marmoleum® Wall Panels.
- Use a 1/16" x 1/16" x 1/16" square notch trowel to apply the L 910W adhesive.
- Use material from the same batch/dye lot.
- Install cuts in order by roll sequence and cuts from each roll.
- Do Not Reverse sheets for installation. The material should all run in the same direction.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Forbo wall products can be installed with the roll length aligned vertically or horizontally. Vertical installations make the material easier to work with. Horizontal installations with longer lengths may be challenging to install. Material waste may also be reduced with vertical alignment.
- Install protective outside corner guards over all outside corners. For inside corners, pattern scribing the material will ensure a tight fit between the sheets.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Bulletin Board

4.81 Installing Bulletin Board

General Installation Guidelines

- Bulletin Board is a uni-colored tackable surface made primarily of linseed oil, ground cork, rosin binders, limestone and color pigments. It is calendared onto a jute backing, which ensures dimensional stability and gives the surface a smooth finish. It is available in rolls 48" in width and up to 90 linear feet in length. Some colors are also available in a 72" in width.
- Areas where Bulletin Board is to be installed 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 environment for at least 48 hours prior to the installation. Areas to receive the material shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the material, and for final inspection.
- Store Bulletin Board rolls standing upright.
- Bulletin Board can be successfully installed over a variety of substrates provided the surface is sound, smooth, flat, clean, and permanently dry. Drywall and wood panels are the most common substrates. For recommendations regarding other substrates, contact Forbo Technical Services.
Regardless of the specific type of substrate that is being installed over, the final determination of suitability for that purpose is the responsibility of the installer and/or installation contractor.
- Always conduct adhesive mat bond tests before beginning 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 910W adhesive.
- Use a 1/16" x 1/16" x 1/16" square notch trowel.
- Use material from the same batch/dye lot.
- Install cuts in order by roll sequence and cuts from each roll.
- Do Not Reverse sheets for installation. The material should all run in the same direction.
- Bulletin Board can be installed with the roll length aligned vertically or horizontally. Vertical installations make the material easier to work with. Horizontal installations with longer lengths may be challenging to install. Material waste may also be reduced with vertical alignment.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits
- If using a press, a quality PVA (polyvinyl acetate) dispersion adhesive may be used in a double-stick method.
- Edges can be finished by fitting a frame around the edge, beveling the edges, milling or cutting the edge straight. For the best results, always use sharp tools or blades when cutting the material.
- Install protective outside corner guards over all outside corners. For inside corners, pattern scribing the material will ensure a tight fit between the sheets.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Bulletin Board

Substrates

Drywall

1. Drywall substrates must be securely fastened and finished in accordance to ASTM C 840.
2. Newly installed drywall should be primed with a good quality primer/sealer.
3. Existing drywall finishes must be in good condition and well bonded. Glazed or glossy surfaces should be fully sanded using coarse grit sandpaper. Textured surfaces must be sanded smooth and/or smoothed using appropriate materials, and primed with a good quality sealer primer. Do not install over existing paper or vinyl wallcovering materials. Refer to the Notes section following these guidelines for additional information.

Wood Panels

1. Wood panels should have a minimum thickness of 1/4".
2. The preferred panel should be rated or manufactured as an underlayment for resilient flooring products. At a minimum, wood panels must have a surface free of irregularities that may telegraph through the Bulletin Board and be manufactured using adhesives that will not be affected by the water-based adhesive used for installation.
3. Panels should be loosely stacked and allowed to acclimate to site conditions for a minimum of 48 hours prior to installation.
4. Wood panels must be securely fastened and free from movement, especially at joints and edges. Always follow the panel manufacturer's recommendations for fastening and joint treatment. In lieu of specific recommendations, experience has shown that satisfactory results for panels 1/4" - 3/8" thick can be obtained by lightly butting panel edges and fastening with ring shank nails or narrow crown divergent point staples 4" apart in the middle of the panel and 2" apart along edges. Variations in panel thickness can be corrected by sanding the thicker panel at joints. Where satisfactory results cannot be obtained by mechanical fastening, panels 1/4" - 3/8" thick should be fully adhered to a flat surface using an adhesive suitable for that purpose.
5. All surface irregularities must be corrected using a good quality patching material intended for that purpose.

Adhesive Application

Proper adhesive application is essential for achieving a secure bond. Bulletin Board must be installed into "wet" adhesive.

1. Apply Forbo L 910W adhesive using a 1/16" x 1/16" x 1/16" square notch trowel. A double sided, replaceable trowel blade is supplied with each four-gallon pail of L 910W adhesive; the trowel handle is not included and can be purchased separately. Keep the trowel notches clean, and replace blades when they begin to wear in order to ensure an adequate and uniform coverage of adhesive.
2. When installing large pieces of Bulletin Board, it may be necessary to apply a quality contact cement or acrylic dispersion adhesive to the upper 10" - 12" of the material and wall. This can prevent the sheet from sliding down along the fresh adhesive.
3. Place the material into the adhesive and roll while the adhesive is still wet enough to achieve a 90% - 100% wet transfer of adhesive to the material backing. Never allow the adhesive to dry to a point that **wet** transfer to the material backing does not occur.
 - The working characteristics (open time and working time) of adhesives are affected by temperature, humidity, air circulation, porosity of the substrate, type of adhesive, and trowel notch; and will vary. In some situations the adhesive will dry more slowly, necessitating an "open time" before placing the material to allow the adhesive to develop body. In other situations the adhesive will dry more rapidly and require that the adhesive be applied incrementally so that the material can be placed and rolled while the adhesive is still wet enough to achieve the transfer necessary for a secure bond. It is the installer's responsibility to recognize the working characteristics of the adhesive for a given situation and make any adjustments to technique that may be required to achieve a secure bond.
4. 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.

Caution: Aggressive cleaning may mar the Bulletin Board surface. The need for aggressive cleaning can be avoided by taking care to keep the surface clean while handling and adhering the sheets.

Installation

1. For each wall, cut pieces of Bulletin Board to the required length and width, adding 2" - 3" in each direction to allow for final trimming. It is preferred that the material is cut 24 hours prior to installation and lay the sheets flat.
2. Relax the "roll curl" by back rolling the material once in the reverse direction or with the face of the material to the inside of the roll. Refer to the Notes section following these guidelines for additional information.
3. Plan the layout to allow for approximately 1/2" - 3/4" of the factory edge to be trimmed from each side of the material for seaming. The seams should fall a minimum of 6" away from joints in the substrate.
4. Allowing for trimming, draw a plumb line on the wall where the seam for the first piece will fall.
5. Using a Forbo Seam and Strip Cutter or a straight edge and knife, trim 1/2" - 3/4" from the seam edge of the first piece. Angle the knife slightly to create an undercut.
6. Trim the sheet and "dry" fit it to the wall section, making sure that the seam edge will align with the plumb line on the wall. Traditional scribing methods generally produce the best results. Establish "set marks" on both the material and the wall to aid in positioning the sheet during installation. Refer to the Notes section following these guidelines for additional information.

Installation: Bulletin Board

7. Adhering the sheet:
 - Starting from the corner, spread adhesive in the area where the first piece will be installed. The plumb line is the boundary for the side opposite the corner. Depending on conditions, it may not be possible to spread adhesive in the entire area without the adhesive becoming too dry before the material is placed.
 - If necessary, only spread adhesive a short distance from the starting point and stop the adhesive spread along a straight vertical line. Do not spread more adhesive than can be covered while the adhesive is still sufficiently wet to achieve a 90% - 100% **wet** transfer to the material backing.
 - Using the set marks and plumb line established during fitting, position the material on the wall, starting at the corner. Roll immediately with a three-section wall roller. Roll thoroughly in both directions, first across the width and then along the length, so that the material backing is firmly pressed into the wet adhesive and any trapped air bubbles are released. Clean excess adhesive while it is still wet. When it is not possible to adhere the entire piece at one time, fold the un-adhered portion of the material back over the adhered portion up to the adhesive spread line. Starting at the spread line, being careful not to overlap the adhesive, continue spreading adhesive toward the plumb line, placing and rolling the material as you go, until the entire piece has been adhered.
 - Repeat this process for each wall. Where inside corners are involved, it is best to work away from the corners where Bulletin Board has already been installed on the adjacent wall.
8. Trim the seam edge for the second piece in the same manner as for the first piece.
9. Allowing for 1/2" - 3/4" overlap at the seam, draw a plumb line on the wall where the second seam will fall.
10. Adhere the second piece in the same manner as the first piece, working away from the seam.
11. Immediately after adhering, use an under scriber to scribe the seam. Cut along the scribe line and roll the seam with a steel seam roller. Do not allow the adhesive in the seam area to dry before cutting and rolling the seam. Refer to the Notes section following these guidelines for additional information.
12. Repeat this process for each piece along the wall, completing the installation of each piece as you go.

Bulletin Board Notes:

- Using a primer/sealer will provide a uniform porosity over the entire surface of the wall, reduce the absorbency of more porous substrates, improve bond over dry, dusty surfaces, and improve the working characteristics of the adhesive. It is recommended to perform a bond test to evaluate the integrity of the "system", and ensure that a secure bond can be achieved. When choosing a primer/sealer, always choose products of the highest quality and always follow the manufacturer's recommendations for use and application. Any liability for the performance of primer/sealers rests solely with the user and/or manufacturer of the product, not with Forbo.
- During storage in roll form, tension develops in Bulletin Board that will cause the ends of pieces cut from the roll to "cup", or not lay flat. This is commonly called "roll curl". This tension must be relaxed prior to installation so that the material will remain flat and in full contact with the adhesive while the adhesive dries. Back rolling pieces prior to installation will remove most of this tension. If installing multiple sheets of Bulletin Board, stack the pre-cut sheets face-to-face and back-to-back to help relieve the roll curl. When short lengths of material are required, it is best to back roll longer pieces before cutting into shorter lengths. It is often necessary to further relax this tension from the very ends of cut pieces. This can be accomplished by folding the corner of the material at an angle to the end, and applying pressure where the fold intersects the end of the piece. Apply pressure firmly across the entire width of the material in a rolling motion until the end lays flat. Care must be taken not to apply too much pressure, which may damage the material.
- Bulletin Board shrinks slightly in the length when installed in wet adhesive. Back rolling the material will minimize shrinkage, but compensation must be made for shrinkage in cuts longer than approximately 20' in length to avoid fitting errors. For longer pieces, only trim to fit at the end where the installation will begin, leaving extra material at the opposite end. Begin adhering the piece at the fitted end and adhere the piece normally, stopping 4' - 5' from the unfitted end; shrinkage will occur as the piece is being installed. Once most of the piece has been adhered, fit the remaining end and adhere normally.
- Bulletin Board may expand slightly in the width when installed in wet adhesive. To compensate for any expansion, make sure the under scriber is adjusted to create a "net" fit (no fullness) and that both seam edges are slightly undercut. This will allow the material to fall into place without force or pressure.
- Bulletin Board may also be adhered to a backer-board and mounted to the wall. For proper counterbalancing, the back of the board should also be covered with the same material as that on the front, in the same direction with the same adhesive and, if possible, at the same time. Depending on the thickness, symmetrical construction and rigidity of the surface (plywood, MDF, etc.), other materials can also be used, such as foils, laminates, impregnated paper or marine lacquers or sprays. It is recommended that a test installation be conducted if you have not worked with the materials before.
- A natural phenomenon occurs in linoleum products that is commonly referred to as "drying room yellowing". During the time the Bulletin Board is curing in the drying room, a yellowish cast may appear on the surface of the material. **This is normal and is NOT a product defect.** This yellow cast will disappear when the Bulletin Board is exposed to light, either natural or artificial. The rate at which drying room yellowing will disappear may vary from a few hours to a few weeks, depending on the type and intensity of the light source.

Installation: Marmoleum® Wainscot

4.82 Installing Marmoleum® Wainscot

General Installation Guidelines

- Marmoleum® is available in rolls 79" in width and up to 105 linear feet in length. It can be installed with the roll length aligned either vertically or horizontally for wainscot applications. Vertical seams can be avoided in most cases with horizontal alignment, but longer lengths may be challenging to install. Material waste is often reduced with vertical alignment.
- Areas where Marmoleum® is to be installed 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 environment for at least 48 hours prior to the installation. Areas to receive the material shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the material, and for final inspection.
- Store Marmoleum® rolls standing upright.
- Marmoleum® can be successfully installed over a variety substrates provided the surface is sound, smooth, flat, clean, and permanently dry. Drywall and wood panels are the most common substrates used in wainscot applications. For recommendations regarding other substrates, contact Forbo Technical Services.
Regardless of the specific type of substrate that is being installed over, the final determination of suitability for that purpose is the responsibility of the installer and/or installation contractor.
- Always conduct adhesive mat bond tests before beginning 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 910W 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 cuts in order by roll sequence and cuts from each roll.
- Do Not Reverse sheets for installation. The material should all run in the same direction.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Install protective outside corner guards over all outside corners.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Marmoleum® Wainscot

Substrates

Drywall

1. Drywall substrates must be securely fastened and finished in accordance to ASTM C 840.
2. Newly installed drywall should be primed with a good quality primer/sealer.
3. Existing drywall finishes must be in good condition and well bonded. Glazed or glossy surfaces should be fully sanded using coarse grit sandpaper. Textured surfaces must be sanded smooth and/or smoothed using appropriate materials, and primed with a good quality sealer primer. Do not install over existing paper or vinyl wallcovering materials. Refer to the Notes section following these guidelines for additional information.

Wood Panels

1. Wood panels should have a minimum thickness of 1/4".
2. The preferred panel should be rated or manufactured as an underlayment for resilient flooring products. At a minimum, wood panels must have a surface free of irregularities that may telegraph through the installed Marmoleum® and be manufactured using adhesives that will not be affected by the water-based adhesive used for installation.
3. Panels should be loosely stacked and allowed to acclimate to site conditions for a minimum of 48 hours prior to installation.
4. Wood panels must be securely fastened and free from movement, especially at joints and edges. Always follow the panel manufacturer's recommendations for fastening and joint treatment. In lieu of specific recommendations, experience has shown that satisfactory results for panels 1/4" - 3/8" thick can be obtained by lightly butting panel edges and fastening with ring shank nails or narrow crown divergent point staples 4" apart in the middle of the panel and 2" apart along edges. Variations in panel thickness can be corrected by sanding the thicker panel at joints. Where satisfactory results cannot be obtained by mechanical fastening, panels 1/4" - 3/8" thick should be fully adhered to a flat surface using an adhesive suitable for that purpose.
5. All surface irregularities must be corrected using a good quality patching material intended for that purpose.

Adhesive Application

Proper adhesive application is essential for achieving a secure bond. Marmoleum® must be installed into **wet** adhesive.

1. Apply adhesive using a 1/16" x 1/16" x 1/16" square notch trowel. A double sided, replaceable trowel blade is supplied with each four-gallon pail of L 910W adhesive; the trowel handle is not included and can be purchased separately. Keep the trowel notches clean, and replace blades when they begin to wear in order to ensure an adequate and uniform coverage of adhesive.
2. Place the material into the adhesive and roll while the adhesive is still wet enough to achieve a 90% - 100% **wet** transfer of adhesive to the material backing. Never allow the adhesive to dry to a point that **wet** transfer to the material backing does not occur.
 - The working characteristics (open time and working time) of adhesives are affected by temperature, humidity, air circulation, porosity of the substrate, type of adhesive, and trowel notch; and will vary. In some situations the adhesive will dry more slowly, necessitating an "open time" before placing the material to allow the adhesive to develop body. In other situations the adhesive will dry more rapidly and require that the adhesive be applied incrementally so that the material can be placed and rolled while the adhesive is still wet enough to achieve the transfer necessary for a secure bond. It is the installer's responsibility to recognize the working characteristics of the adhesive for a given situation and make any adjustments to technique that may be required to achieve a secure bond.
3. 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.

Installation: Marmoleum® Wainscot

Vertical Installation

1. For each wall, cut pieces of Marmoleum® to the required length and width, adding 1" - 2" in each direction to allow for final trimming.
2. Relax the "roll curl" by back rolling the material with the face of the material to the inside of the roll. Refer to the Notes section following these guidelines for additional information.
3. Where inside corners are involved, it is best to work away from corners where Marmoleum® has already been installed on the adjacent wall.
4. Plan the layout to allow for approximately 1/2" - 3/4" to be trimmed from each factory edge for seaming, and so that seams will fall at least 6" away from joints in the substrate.
5. Allowing for trimming, draw a plumb line on the wall where the seam for the first piece will fall.
6. Using a Forbo Seam and Strip Cutter, or a straightedge and knife, trim 1/2" - 3/4" from the seam edge of the first piece. Angle the knife slightly to create an undercut.
7. Trim the sheet and "dry" fit it to the wall section, making sure that the seam edge will align with the plumb line on the wall. Traditional scribing methods generally produce the best results. Establish "set marks" on both the material and the wall to aid in positioning the sheet during installation. Refer to the Notes section following these guidelines for additional information.
8. Adhering the sheet:
 - Starting from the corner, spread adhesive in the area where the first piece will be installed. The plumb line is the boundary for the side opposite the corner. Depending on conditions, it may not be possible to spread adhesive in the entire area without the adhesive becoming too dry before the material is placed. If necessary, only spread adhesive a short distance from the starting point and stop the adhesive spread along a straight vertical line. Do not spread more adhesive than can be covered while the adhesive is still sufficiently wet to achieve a 90% - 100% **wet** transfer to the material backing.
 - Using the set marks and plumb line established during fitting, position the Marmoleum® on the wall, starting at the corner. Roll immediately with a three-section wall roller. Roll thoroughly in both directions, first across the width and then along the length, so that the material backing is firmly pressed into the wet adhesive and any trapped air bubbles are released. Clean excess adhesive while it is still wet. When it is not possible to adhere the entire piece at one time, fold the un-adhered portion of the material back over the adhered portion up to the adhesive spread line. Starting at the spread line, being careful not to overlap the adhesive, continue spreading adhesive toward the plumb line, placing and rolling the material as you go, until the entire piece has been adhered.
9. Trim the seam edge for the second piece in the same manner as for the first piece.
10. Allowing for 1/2" - 3/4" overlap at the seam, draw a plumb line on the wall where the second seam will fall.
11. Adhere the second piece in the same manner as the first piece, working away from the seam.
12. Immediately after adhering, use an under scribe to scribe the seam. Cut along the scribe line and roll the seam with a steel seam roller. Do not allow the adhesive in the seam area to dry before cutting and rolling the seam. Refer to the Notes section following these guidelines for additional information.
13. Repeat this process for each piece along the wall, completing the installation of each piece as you go.

Horizontal Installation

1. For each wall, cut pieces of Marmoleum® to the required length and width, adding 1" - 2" in each direction to allow for final trimming.
2. Relax the "roll curl" by back rolling the material with the face of the material to the inside of the roll. Refer to the Notes section following these guidelines for additional information.
3. Trim the sheet and "dry" fit it to the wall section. Traditional scribing methods generally produce the best results. Establish "set marks" on both the material and the wall to aid in positioning the sheet during installation. Refer to the Notes section following these guidelines for additional information.
4. Adhering the sheet:
 - Where inside corners are involved, it is best to work away from corners where Marmoleum® has already been installed on the adjacent wall.
 - Begin spreading adhesive at one end of the wall, working away from the end. Depending on conditions, it may not be possible to spread adhesive on the entire wall without the adhesive becoming too dry before the material is placed. If necessary, only spread adhesive a short distance from the starting point and stop the adhesive spread along a straight vertical line. Do not spread more adhesive than can be covered while the adhesive is still sufficiently wet to achieve a 90 - 100% **wet** transfer to the material backing.
 - Using the set marks established during fitting, position the Marmoleum® on the wall, starting at the corner. Roll immediately with a three-section wall roller. Roll thoroughly in both directions, first across the width and then along the length, so that the material backing is firmly pressed into the wet adhesive and any trapped air bubbles are released. Clean excess adhesive while it is still wet. When it is not possible to adhere the entire length of the wall at one time, fold the un-adhered portion of the material back over the adhered portion up to the adhesive spread line. Starting at the spread line, being careful not to overlap the adhesive, continue spreading adhesive along the remaining length of the wall, placing and rolling the material as you go, until the entire length of the wall has been adhered.
 - Repeat this process for each wall.

Installation: Marmoleum® Wainscot

Marmoleum® Wainscot Notes:

- Using a primer/sealer will provide a uniform porosity over the entire surface of the wall, reduce the absorbency of more porous substrates, improve bond over dry, dusty surfaces, and improve the working characteristics of the adhesive. It is recommended to perform a bond test to evaluate the integrity of the “system”, and ensure that a secure bond can be achieved. When choosing a primer/sealer, always choose products of the highest quality and always follow the manufacturer’s recommendations for use and application. Any liability for the performance of primer/sealers rests solely with the user and/or manufacturer of the product, not with Forbo.
- During storage in roll form, tension develops in Marmoleum® that will cause the ends of pieces cut from the roll to “cup”, or not lay flat. This is commonly called “roll curl”. This tension must be relaxed prior to installation so that the material will remain flat and in full contact with the adhesive while the adhesive dries. Back rolling pieces prior to installation will remove most of this tension. When short lengths of material are required, it is best to back roll longer pieces before cutting into shorter lengths. It is often necessary to further relax this tension from the very ends of cut pieces. This can be accomplished by folding the corner of the material at an angle to the end, and applying pressure where the fold intersects the end of the piece. Apply pressure firmly across the entire width of the material in a rolling motion until the end lays flat. Care must be taken not to apply too much pressure, which may damage the material.
- Marmoleum® shrinks slightly in the length when installed in wet adhesive. Back rolling the material will minimize shrinkage, but compensation must be made for shrinkage in cuts longer than approximately 20’ in length to avoid fitting errors. For longer pieces, only trim to fit at the end where the installation will begin, leaving extra material at the opposite end. Begin adhering the piece at the fitted end and adhere the piece normally, stopping 4’ - 5’ from the unfitted end; shrinkage will occur as the piece is being installed. Once most of the piece has been adhered, fit the remaining end and adhere normally.
- Marmoleum® may expand slightly in the width when installed in wet adhesive. To compensate for any expansion, make sure the under scriber is adjusted to create a “net” fit (no fullness) and that both seam edges are slightly undercut.

Installation: Marmoleum® Wall Panels

4.83 Installing Marmoleum® Wall Panels

General Installation Guidelines

- Marmoleum® Wall Panel are available in two types of panels:
 - Standard Panels have a 1/4" MDF core, with approximate total thickness of 0.36" (9.2 mm).
 - Sustain Panels have a 1/4" NAUF (No Added Urea Formaldehyde) core, with approximate thickness of 0.36" (9.2 mm).
- Both types of panels meet CARB Phase 1 requirements and have a Greenguard certified backing. Non-harmful, low VOC adhesives are used to adhere the Marmoleum® and backer to the core.
- 38" x 96" panels are available for use where material will run horizontally.
- 48" x 78" panels are available for use where material will run vertically.
- Areas where Marmoleum® Wall Panels are to be installed 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 should be conditioned in the same environment for at least 48 hours prior to the installation. Areas to receive the material and adhesive shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the material, and for final inspection.
- Store Marmoleum® Wall Panels stacked and laying flat.
- Marmoleum® Wall Panels can be successfully installed over a variety substrates provided the surface is sound, smooth, relatively flat, clean, and permanently dry. Drywall and wood panels are the most common substrates used in wainscot applications. Regardless of the substrate, it must be free of dust, dirt, grease, paint, old adhesive residue, oils, solvents or any other contaminant that could interfere with a secure bond. If there is an existing wall finish, it must be fully adhered or fastened. Any loose areas must be removed and repaired, re-adhered or mechanically fastened to ensure the integrity of the Marmoleum® Wall Panel system. Installation directly over existing vinyl wallcovering is not recommended. For recommendations regarding other substrates, contact Forbo Technical Services.
Regardless of the specific type of substrate that is being installed over, the final determination of suitability for that purpose is the responsibility of the installer and/or installation contractor.
- Always conduct adhesive mat bond tests before beginning 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 a good quality construction adhesive.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Install protective outside corner guards over all outside corners.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation: Marmoleum® Wall Panels

Panel Layout

1. Establish a level line where the top of the Marmoleum® Wall Panels will fall.
2. Determine the location of the panel joints. It is recommended that the panels be centered along the length of the wall with the minimum number of vertical joints (i.e. the border pieces will be larger than 1/2 the panel width).

Installation

If the panels are to be installed off the floor and not supported by a solid baseboard, the lower “J” Mold must be secured to the wall. Use screws at each vertical wall stud. It may be necessary to countersink the screw heads to avoid interference with the panels.

Note: If the wall is not flat, it may be necessary to use temporary bracing to hold the panel in contact with the adhesive while the adhesive is drying.

Though not required, it is suggested to begin the installation at an outside corner, if one exists, and work from left to right toward an inside corner. This will make it easier to install the inside corner pieces. If there are no outside corners, begin the installation with the first full width panel away from an inside corner to the left.

1. If necessary, cut the first panel to be installed to size and make any cutouts for electrical outlets, etc.
Note: Always use a sharp saw and cut with the saw teeth cutting into the face of the Marmoleum® Wall Panel to minimize chipping along the cut edge.
2. Dry fit the panel and draw a pencil line on the substrate at the side(s) of the panel.
3. Adhesive application:
 - a. Use a good quality construction adhesive for adhering Marmoleum® Wall Panels.
 - b. Apply a 1/4" - 3/8" bead of adhesive to the wall 1" - 2" away from the edge around the perimeter of the area where the panel is to be installed, and vertically 18" - 20" on center in the middle of the area.
4. Place the panel into position and rub or roll firmly to ensure the panel is pressed completely into the adhesive.
5. Immediately pull the panel away from the wall and then back again. This will allow the adhesive to “flash off” and also enable the identification of any area that the panel was not in full contact with the adhesive. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
6. Use 6d finish nails to temporarily hold the panel in position while the adhesive is drying. The nails should be placed in areas that will be covered later by molding whenever possible.
Note: If the hole will not be covered, a matching filler can be made by sanding or scraping the surface of a scrap piece of panel to produce a powder of the Marmoleum® material. This powder can then be mixed with a white glue to create a color-matched paste that can be used to fill any exposed nail holes. Refer to the Repairs section of this guide for additional information.
7. Continue this process for each panel along the wall, placing the connector “T” molding between each panel as the work progresses.
8. Starting with the first panel on the adjacent wall, adhere the inside corner molding to the panel before adhering the panel to the wall.
9. Continue this process around the room until the installation is complete.

Installation: Forbo Wall Base

4.91 Installing Forbo Wall Base

General Installation Guidelines

- Areas to receive Forbo Wall Base 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 should be unrolled and allowed to relax in the same environment with the adhesive for at least 48 hours prior to the installation. Areas to receive material shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the flooring, and for final inspection.
- The wall surface must be permanently dry, smooth, and free from dirt, wallpaper, vinyl wall covering, grease, old adhesives and other contaminants that could interfere with the adhesive bond.
- 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 a quality acrylic wall base adhesive.
- Use a V notch spreader. If using cartridges, a three-hole nozzle for 4" base or a five-hole nozzle for 6" base.
- Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
- Installation of Forbo Wall Base over non-porous surfaces, including vinyl wall coverings, is not recommended. Vinyl wall covering should extend no more than 1/4" below the top of the base.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation

1. Apply the adhesive to the wall or to the back of the base. In order to avoid excess adhesive at the top of the base, apply the adhesive no closer than 1/4" to the top of the base if using a spreader, or 1" if using cartridges.
2. Install the base within 20 minutes of adhesive application.
3. If the wall or floor surface is uneven, it may be necessary to trim the edges of adjoining pieces before installing so that a tight joint can be achieved. Use a razor type utility knife and cut the base from the face side.
4. Immediately after installation, roll the base with a hand roller to ensure that proper adhesive transfer is achieved (Figure 4.91a). If a hand roller is unavailable, firmly press the base into the adhesive using a clean, soft cloth dampened with water.
5. Roll or rub the base in the opposite direction of installation to avoid stretching the base.
6. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive can be removed with a clean white cloth and mineral spirits.
Note: If excess adhesive is not removed, a stain may occur.



Figure 4.91a

Installation: Forbo Wall Base

Fitting Inside Corners

Option 1: Wrapped Inside Corner

1. Determine the location of the inside corner and draw a straight line from the top to the bottom of the base on the back side.
2. Using a utility knife and a straight edge, cut partially through the base along the line (approximately 25% of the thickness of the base).
3. Where the line meet the toe of the base, cut a small 90° triangular wedge to remove the toe (Figure 4.91b).
4. Using a hot air blower, warm the back of the base along the line. Apply heat carefully because excessive heat may blister or deform the base.
5. Fold base at mark with face in. While base is still warm, apply adhesive and press into the corner. Carefully push the toe of wall base against the wall to close the triangle.
6. Promptly roll the base.
7. Cool by holding a wet cloth against the corner. Wipe dry.

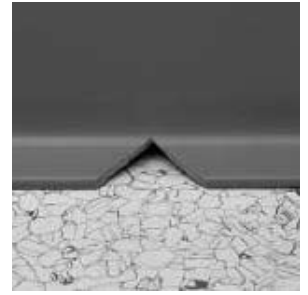


Figure 4.91b

Option 2: Fitted Inside Corner

1. Before applying adhesive, use dividers to scribe fit the base to the first side of the inside corner.
2. After fitting the first side of the corner, apply adhesive and install the piece of base.
3. Following the same procedure as above, scribe fit the base for the second side of the inside corner.
4. Dry fit the second side of the inside corner and make any adjustments as necessary to ensure a tight fit.
5. Apply adhesive and install the base for the second side of the inside corner.

Fitting Outside Corners

1. When approaching an outside corner, stop the application of adhesive a comfortable distance from the corner.
2. Extend the base past the corner.
3. Using a pencil, mark the back of the base using the corner as a guide.
4. Fold the base face in at the line and shave the back while folded (Figure 4.91c), removing the line and approximately 1/8" of base material on either side of it. If using a topset gouge, turn the base face down and make the cut starting at the top and working down to the bottom (Figure 4.91c, Cut #1).

Note: Always gouge on the side of the line in the direction the base will be going.

Important: The depth of this area at its deepest point should not exceed approximately 25% of the base thickness.

5. To ensure that the toe sits flush against the floor, the initial cut can be widened on either side of the line (Figure 4.91c, Cut #2) near the bottom of the base. This cut is optional. Make the cut (gouge) downward, widening the initial cut to approximately 1/2" at the bottom.
6. Using a hot air blower, warm the back of the base along the line. Apply heat carefully because excessive heat may blister or deform the base.
7. Pull up on the toe and turn it inside out. Position the base after applying adhesive and set into place allowing the toe to drop down to form a perfect corner.
8. Roll thoroughly or firmly press corner against the wall.

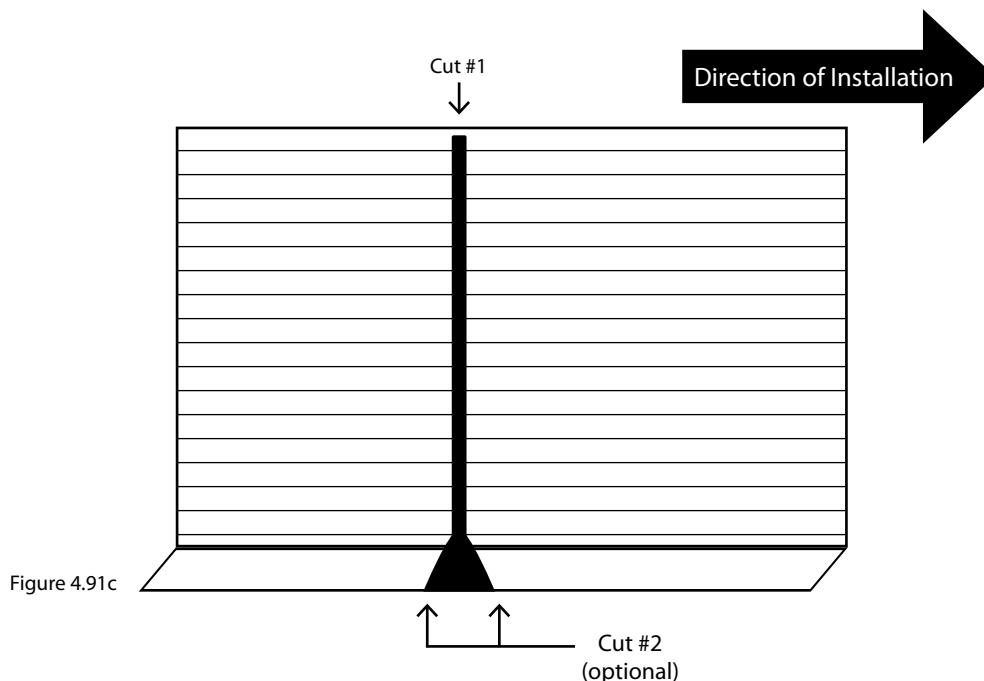


Figure 4.91c

Installation: Forbo Installation Accessories

4.92 Installing Forbo Installation Accessories

General Installation Guidelines

- Areas to receive Forbo Installation Accessories 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 Installation Accessories should be allowed to relax in the same environment with the adhesive for at least 48 hours prior to the installation. Areas to receive material shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the flooring, and for final inspection.
- The substrate must be sound, smooth, permanently dry and free from dirt, grease, old adhesives and other contaminants that could interfere with the adhesive bond.
- 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 a premium brush grade contact adhesive.
- Remove wet contact adhesive with water. For dried contact adhesive, simply rub off. If excess adhesive is not removed, a stain may occur.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Installation

1. Measure the length of transition needed and cut with a sharp knife.
2. Apply the contact cement to both surfaces. The contact cement should be brush applied uniformly, with complete coverage on each of the two surfaces. Take care not to get the contact cement on the face of the transition.
Note: Ensure that the area of work is well ventilated. Do not use contact cement near fire or flame and make sure that pilot lights or other ignition sources are turned off.
3. Allow the contact cement to dry almost completely. The adhesive should be slightly tacky, but not transfer to the finger when lightly touched.
Note: If the two surfaces do not adhere immediately, the adhesive has likely been allowed to dry too long. In this case, re-apply another thin coat of adhesive to each surface.
4. Position the transition carefully. The adhesive will grab immediately and the transition cannot be re-positioned or adjusted.
5. Apply a firm pressure over the entire length of the transition in order to fully seat the transition into the adhesive.
6. Remove wet contact adhesive with water. For dried contact adhesive, simply rub off.
Note: If excess adhesive is not removed a stain may occur.

*Choosing Contact Cement:

The specific composition of TPR (Rubber/Vinyl Alloy) transition profiles varies among manufacturers, as do the solvent systems in different brands of contact cements. For this reason, not every brand of contact cement is compatible with every brand of transition profile. Certain solvent systems will extract plasticizers from certain formulations of TPR transitions, resulting in a gumming of the contact cement, poor adhesion and, or, shrinkage of the transition profile over a longer term.

In order to determine the compatibility of a contact cement with Forbo Installation Accessories, apply the contact cement to a small scrap of the transition material and allow to dry for 10 - 25 minutes. If the contact cement dries to only a slight tack, with no transfer at all to the finger, the contact cement is compatible with Forbo Installation Accessories. If, after 30 minutes, the contact cement remains even slightly soft and/or gummy, the contact cement is not compatible and should not be used to install Forbo Installation Accessories.

Heat Welding: Marmoleum® & Linoleum

5.1 Heat Welding: Marmoleum® & Linoleum Products

General Installation Guidelines

- Heat welding Forbo Marmoleum® and linoleum products is not always necessary.
- Heat welding provides a watertight and hygienic seam.
- It can also be used to provide an artistic touch.
- Forbo Marmoleum® and linoleum products may be heat welded with either a matching solid or multi-colored welding rod or a contrasting colored welding rod.
- All welding should only be done after the flooring adhesive has set up or approximately 24 hours after installation.
- The depth of the groove on 2.0 mm and 2.5 mm material should be down to the jute fibers but not through them.
- The material should be grooved to a 3.5 mm wide U-shape.
- Use a 5 mm speed tip.
- Optimal temperature for welding Marmoleum® and linoleum products is 350° C (662° F).
- It is recommended to practice on a scrap piece of material first to assure proper temperature and speed.
- Use only Forbo Marmoweld® welding rod.
Note: Forbo's multi-colored welding rod is square shaped instead of round. HOWEVER, all tools and installation procedures are the same as for the standard round solid color rod.
- Marmoweld® is made of a solidified adhesive which is melted and fused (by use of a hot air welding gun) into a joint that has been grooved in the material.
- 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.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Heat Welding: Marmoleum® & Linoleum

Procedure

Seams should be prepared according to recommended seaming procedures. If there are any gaps in the seam, the integrity of the heat weld may be compromised.

1. Groove seam using the Forbo Groover (Figure 5.1a) or an electric grooving tool. The depth of the groove on 2.0 mm and 2.5 mm gauge should be down to the jute fibers but not through them. On thicker gauge materials, groove to a depth of 2.5 mm. Grooving to the proper width and depth is very important to ensure the welding rod can achieve a secure bond to the flooring material.

2. At the ends of the seam, in doorways or other areas where the Forbo Groover cannot reach, complete the groove using the Forbo Hand Groover (Figure 5.1b).

Note: The Forbo Groover and the Forbo Hand Groover use the same blade (3.5 mm wide U-shape) to ensure the width of all finished heat welds will be consistent in width throughout the project.

3. The optimal temperature setting for Marmoleum® and linoleum products is 350° C (662° F). The welding gun should be fitted with a 5 mm speed tip. Preheat the welding gun for several minutes before beginning to heat weld. This will allow the gun to reach the proper welding temperature.

Note: Forbo recommends using only professional quality heat welding equipment. Equipment of lesser quality often does not operate at a consistent temperature and using such equipment may result in an inadequate bond of the heat weld.

4. Make sure the groove is thoroughly clean before beginning to heat weld. Make sure that all cords are laid out without tangles and that there are no obstructions along the seam to be welded. Cut a length of welding rod long enough to heat weld approximately half of the length of the seam.

5. Start the weld at one wall and weld toward the center of the seam (Figure 5.1c). To begin the weld, first position the welding tip near the starting point before inserting the welding rod into the tip. Once the welding gun is in position, insert the welding rod through the speed tip, place the welding rod into the seam against the wall, and while applying a firm downward force, feed the welding rod into the speed tip while pulling the welding gun away from the wall. In order to avoid pulling the welding rod out of the seam, continue feeding the weld rod into the speed tip for the first few inches of weld. After welding the first few inches, the weld rod at the beginning will have cooled and will be bonded well enough that the welding gun can simply be guided along the seam without further need to feed the welding rod.

Note: To ensure a proper weld, the base of the welding tip should be held parallel to the flooring surface in line with the seam and directly over the groove. A slight downward pressure should be maintained so that the welding tip will force the melting welding rod completely into the groove. The correct welding speed is determined by observing the way the welding rod is melting into the groove. It should be allowed to melt enough so that the melted rod reaches the bottom of the groove. The top of the welding rod should flatten slightly and a small bead should form on either side of the welding tip. If the welding speed is too slow, the welding rod will tend to become liquid and puddle around the tip. If the welding speed is too fast, the welding rod will maintain a rounded appearance on the top and will not flow into the groove.

6. After completing the weld for the first half of the room, the excess weld rod must be trimmed. Make the first trim pass using a crescent shaped knife and trim plate (Figure 5.1d). When trimming, apply uniform pressure to the trim knife and trim in one continuous movement rather than short, choppy movements.

Note: The first trim pass should always be made while the welding rod is still slightly warm (not hot). In some cases, it may be necessary to weld shorter sections of the seam so that the first trim pass can be completed before the weld rod cools too much. Alternatively, a colleague can begin the first trim pass while the remainder of the seam is being welded.



Figure 5.1a



Figure 5.1b



Figure 5.1c



Figure 5.1d

Heat Welding: Marmoleum® & Linoleum

7. After completing the first trim pass, inspect the welded seam to ensure that the heat weld is properly bonded for the entire length. If there are areas where the welding rod did not properly bond (Figure 5.1e), a new piece of rod can be welded into it's place and trimmed as follows:
 - Prepare the area to be repaired by cutting out the poorly bonded weld rod. Do not pull out the loose weld rod because doing so may damage the groove.
 - At each end of the area to be re-welded, cut a V-shaped notch into the end of the remaining welding rod (Figure 5.1f). Cutting this notch will aid in blending the new weld into the existing weld.
 - After preparing the area, begin to heat weld on top of the existing welding rod at one end of the repair area. Overlap the weld approximately 1" - 1½" (Figure 5.1g).
 - Continue welding and overlap the existing welding rod on the other end approximately 1" - 1½" to complete the repair (Figure 5.1h).
 - Again, using the crescent shaped knife and trim plate, make the first pass trim to remove the excess weld from the repaired area.

Note: All welding repairs should be made before making the final trim. Once the final trim has been completed, it is very difficult to blend the repair to the existing heat weld.
8. When heat weld and first trim pass for the first half of the seam have been completed, prepare the end of the weld for receiving the heat weld from the other end of the seam by cutting a V-shaped notch at the open end of the first section of the weld.
9. Following the same procedure used for the first end of the seam, begin heat welding at the opposite wall and overlap the second heat weld over the first heat weld approximately 2" where they join.
10. Trim the excess weld using a crescent shaped knife and trim plate and complete any repairs that may be necessary.
11. Before making the final trim pass, wait until the welding rod has cooled to the touch. After it has cooled, make the final trim over the entire seam using only the crescent shaped knife (Figure 5.1i) to complete the heat weld (Figure 5.1j). When trimming, apply uniform pressure to the knife and trim in one continuous movement, rather than short, choppy movements.
12. A heated smoothing tool may be used to touch up minor irregularities in the finished weld. The heat weld will achieve maximum bond strength in 24 hours.

Note: When Marmoleum® and linoleum products are installed adjacent to a vinyl flooring product, Marmoweld® welding rod must be used to heat weld the seam if heat welding is specified. A vinyl welding rod will not bond to Marmoleum® and linoleum products, but Marmoweld® will achieve an adhesive bond to most vinyl flooring products.

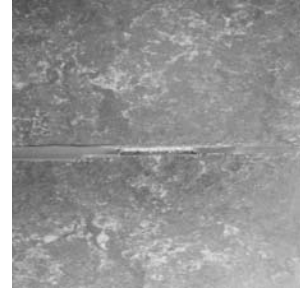


Figure 5.1e



Figure 5.1f



Figure 5.1g



Figure 5.1h



Figure 5.1i

Heat Welding: Vinyl Products

5.2 Heat Welding Vinyl Products

General Installation Guidelines

- Heat welding Forbo vinyl sheet products is required for all seams, coving, and corner fill pieces. Heat welding Forbo ColoRex® SD/EC is not always necessary.
- Heat welding provides for a strong, watertight and hygienic seam.
- It can also be used to provide an artistic touch.
- Forbo vinyl products may be heat welded with either a matching colored welding rod or a contrasting colored welding rod.
- All welding should only be done after the flooring adhesive has set up or approximately 24 hours after installation.
- The depth of the groove should be approximately 2/3 into the depth of the material.
- The material should be grooved to a 3.5 mm wide U-shape.
- Use a 5 mm speed tip.
- To determine the optimal temperature setting for welding vinyl products, pre-heat the welding gun. Hold a piece of the vinyl welding rod in front of the speed tip. The desired result is to melt the welding rod but **not** scorch it. If the welding rod scorches, lower the temperature until the correct temperature melts the welding rod with no scorching.
- It is recommended to practice on a scrap piece of material first to assure proper temperature and speed.
- Use only Forbo vinyl welding rod.
Note: The welding rod for Forbo vinyl products is made of pure PVC, which is designed to melt at the same temperature as the PVC of the vinyl flooring. You should never use welding rods other than those specified by the product manufacturer.
- 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.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

Heat Welding: Vinyl Products

Procedure

Seams should be prepared according to recommended seaming procedures. If there are any gaps in the seam, the integrity of the heat weld may be compromised.

1. Groove seam using the Forbo Groover (Figure 5.1a) or an electric grooving tool. The depth of the groove should be 2/3 the depth of the material. Grooving to the proper width and depth is very important to ensure the welding rod can achieve a secure bond to the flooring material.
Note: Due to the abrasive qualities of the metalized carborundum chips in the Eternal Step SR, groover blades will have a very short life. If using an electric groover on these products, only use a carbide diamond tip blade. Conventional electric groover blades will have a very short life.
2. At the ends of the seam, in doorways or other areas where the Forbo Groover cannot reach, complete the groove using the Forbo Hand Groover (Figure 5.1b).
Note: The Forbo Groover and the Forbo Hand Groover use the same blade (3.5 mm wide U-shape) to ensure the width of all finished heat welds will be consistent in width throughout the project.
3. To determine the optimal temperature setting for heat welding vinyl products, hold a piece of the vinyl welding rod in front of the speed tip. The desired result is to melt the welding rod but **not** scorch it. If the welding rod scorches, lower the temperature until the correct temperature melts the welding rod with no scorching. The welding gun should be fitted with a 5 mm speed tip. Preheat the welding gun for several minutes before beginning to heat weld. This will allow the gun to reach the proper welding temperature.
Note: Forbo recommends using only professional quality heat welding equipment. Equipment of lesser quality often does not operate at a consistent temperature and using such equipment may result in an inadequate bond of the heat weld.
4. Make sure the groove is thoroughly clean before beginning to heat weld. Make sure that all cords are laid out without tangles and that there are no obstructions along the seam to be welded. Cut a length of welding rod long enough to heat weld approximately half the length of the seam.
5. Start the weld at one wall and weld toward the center of the seam (Figure 5.1c). To begin the weld, first position the welding tip near the starting point before inserting the welding rod into the tip. Once the welding gun is in position, insert the welding rod through the speed tip, place the welding rod into the seam against the wall, and while applying a firm downward force, feed the welding rod into the speed tip while pulling the welding gun away from the wall. In order to avoid pulling the welding rod out of the seam, continue feeding the weld rod into the speed tip for the first few inches of weld. After welding the first few inches, the weld rod at the beginning will have cooled and will be bonded well enough that the welding gun can simply be guided along the seam without further need to feed the welding rod.
Note: To ensure a proper weld, the base of the welding tip should be held parallel to the flooring surface in line with the seam and directly over the groove. A slight downward pressure should be maintained so that the welding tip will force the melting welding rod completely into the groove. The correct welding speed is determined by observing the way the welding rod is melting into the groove. It should be allowed to melt enough so that the melted rod reaches the bottom of the groove. The top of the welding rod should flatten slightly and a small bead should form on either side of the welding tip. If the welding speed is too slow, the welding rod will tend to become liquid and puddle around the tip. If the welding speed is too fast, the welding rod will maintain a rounded appearance on the top and will not flow into the groove.
6. After completing the weld for the first half of the room, the excess weld rod must be trimmed. Make the first trim pass using a crescent shaped knife and trim plate (Figure 5.1d). When trimming, apply uniform pressure to the trim knife and trim in one continuous movement rather than short, choppy movements.
Note: The first trim pass should always be made while the welding rod is still slightly warm (not hot). In some cases, it may be necessary to weld shorter sections of the seam so that the first trim pass can be completed before the weld rod cools too much. Alternatively, a colleague can begin the first trim pass while the remainder of the seam is being welded.
When heat welding Eternal Step SR, the welding rod is trimmed in one step, after the rod is cooled using a Pajarito Knife. Refer to the Accessories and Tools section of this guide for additional information on the Pajarito Knife.



Figure 5.1a



Figure 5.1b



Figure 5.1c



Figure 5.1d

Heat Welding: Vinyl Products

7. After completing the first trim pass, inspect the welded seam to ensure that the heat weld is properly bonded for the entire length. If there are areas where the welding rod did not properly bond (Figure 5.1e), a new piece of rod can be welded into it's place and trimmed as follows:
 - Prepare the area to be repaired by cutting out the poorly bonded weld rod. Do not pull out the loose weld rod because doing so may damage the groove.
 - At each end of the area to be re-welded, cut a V-shaped notch into the end of the remaining welding rod (Figure 5.1f). Cutting this notch will aid in blending the new weld into the existing weld.
 - After preparing the area, begin to heat weld on top of the existing welding rod at one end of the repair area. Overlap the weld approximately 1" - 1½" (Figure 5.1g).
 - Continue welding and overlap the existing welding rod on the other end approximately 1" - 1½" to complete the repair (Figure 5.1h).
 - Again, using the crescent shaped knife and trim plate, make the first pass trim to remove the excess weld from the repaired area.

Note: All welding repairs should be made before making the final trim. Once the final trim has been completed, it is very difficult to blend the repair to the existing heat weld.
8. When heat weld and first trim pass for the first half of the seam have been completed, prepare the end of the weld for receiving the heat weld from the other end of the seam by cutting a V-shaped notch at the open end of the first section of the weld.
9. Following the same procedure used for the first end of the seam, begin heat welding at the opposite wall and overlap the second heat weld over the first heat weld approximately 2" where they join.
10. Trim the excess weld using a crescent shaped knife and trim plate and complete any repairs that may be necessary.
11. Before making the final trim pass, wait until the welding rod has cooled to the touch. After it has cooled, make the final trim over the entire seam using only the crescent shaped knife (Figure 5.1i) to complete the heat weld (Figure 5.1j). When trimming, apply uniform pressure to the knife and trim in one continuous movement, rather than short, choppy movements.
12. A heated smoothing tool may be used to touch up minor irregularities in the finished weld.

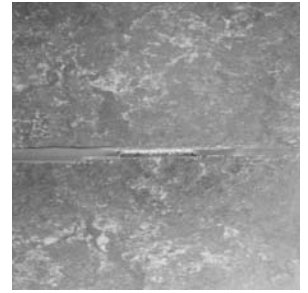


Figure 5.1e



Figure 5.1f



Figure 5.1g



Figure 5.1h



Figure 5.1i

Flash Coving: Marmoleum® & Linoleum

6.1 Flash Coving: Marmoleum® & Linoleum Products

General Installation Guidelines

- Forbo Marmoleum® and linoleum products may be flash coved. Flash coving is the extension of the flooring material up the wall, usually 4" - 6".
- Flash cove Marmoleum® and linoleum products using standard pattern scribing procedures for coving.
- Pay equal attention to both wall preparation and floor preparation. The flooring material can only be as good as what it covers.
Note: Do not cove the material over non-porous surfaces such as vinyl wallcoverings, marlite, HPL, epoxy paint, etc. without first making sure a proper bond can be achieved.
- Cove sticks must always be used when flash coving Marmoleum® and linoleum products. A cove stick is used where the floor and wall meet to provide support for the back of the floor covering (Figure 6.1a).
- Cove sticks are usually made from wood, vinyl, plastic and rubber. Any type can be used provided:
 - It must have a minimum radius of 7/8".
 - It is hard and rigid. Soft, flexible types will not give adequate support for the flooring.
 - It is a material that will not stain the floor covering.
- All corners of the cove stick should be cut with a miter box and saw.
- Cove sticks may be glued or nailed to the wall. If using nails, make sure the nail heads are flush so they will not show through the flooring.
- Cove caps are used to finish off the top edge of the flooring material. Caps are available in metal, vinyl and rubber. The vinyl and rubber caps are available in a wide range of colors and are easier to install. Metal caps are more durable and easier to scribe and fit the flooring to. When using metal caps, it is best to use miter cutters and form wrap around corners.
- Fastening the cove cap to the wall may be accomplished by several different methods, depending on the type of wall surface. The fastest and easiest method, which works on all wall surfaces, is double face foam tape, available through Forbo Flooring.
- Several methods of pattern scribing may be employed when installing Marmoleum® and linoleum products. The installer should always use the method with which they are most comfortable with and that offers the best possible results.
- 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.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

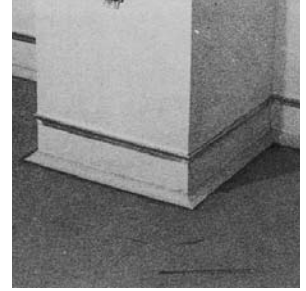


Figure 6.1a

Flash Coving: Marmoleum® & Linoleum

Pattern Scribing With Templates

1. A common method is using the “T” template and the inside corner template (Figure 6.1b).
2. After installing the cove stick and cap, and the floor preparation has been completed, cut the pattern felt to within 1/4” of the bottom of the cove stick and tape the felt to the subfloor to prevent movement (Figure 6.1c). It is important to make hash marks at all seams on the felt to assure proper pattern alignment.
3. Using a pencil and the “T” template (Figure 6.1d), start in one area and progress around the room pressing the template firmly into the cove stick and under the cove cap. To mark an inside corner, place the template under the cap strip and tight to the inside corner. Mark the base and sides of the template. Repeat on the other side of the corner (Figure 6.1e). Mark several places on the wall to show the height of the cap. Continue around the room, marking all inside corners. Door casings and other obstacles can be marked with dividers and a square (Figure 6.1f). Outside corners are done by using a “boot” or mitered corner. Try to put the boot on the least conspicuous side. Mark the cove cap on both sides of the corner (Figure 6.1g). Allow for approximately a 1” overhang on the side not being filled. On the boot side of the corner, straight edge the pattern felt 1 1/2” away and parallel to the bottom of the cove stick (Figure 6.1h). Use a straight edged piece of scrap and place it on the miter of the cove stick and extend it out to the straight edged line on the pattern felt and mark.
4. The use of set marks on the felt and on the subfloor will help in aligning the material during installation. Make sure to check all marks before removing the pattern felt from the floor.
5. Place the pattern felt on the linoleum floor covering, align pieces of felt and secure to the flooring with tape (Figure 6.1i). Place the “T” template on the lines drawn on the pattern felt and trace onto flooring to determine the top of the cove cap (Figure 6.1j).
6. When marking the inside corners, place the template on the lines made on the felt. Mark the template on the under side of the cove cap and inside the corner. Repeat on the other side. Place the inside corner template on the marks made on the inside corner and trace it with a pencil (Figure 6.1k). Continue around the pattern, marking and connecting all areas that fit under the cove cap. Mark all door casings and obstacles using dividers and/or a square.
7. On an outside corner, first mark the piece that extends past the corner and follow the same shape of the radius of the mitered cove stick. Using a square on the straight edge line (1 1/2” from the base of the cove stick) of the pattern where the boot will be placed, cut the linoleum floor covering along the square, starting at the miter and continuing back a distance slightly greater than the height of the cove cap and up the material where the boot will fit in. Make sure it is cut at a 90° angle.
8. After all marks have been transferred from the pattern felt, cut out the material.

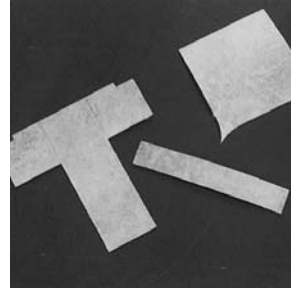


Figure 6.1b

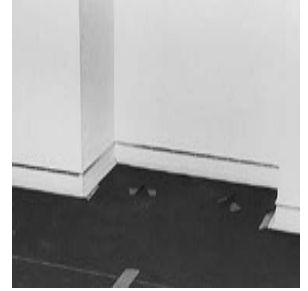


Figure 6.1c

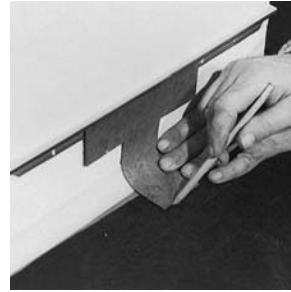


Figure 6.1d



Figure 6.1e



Figure 6.1f



Figure 6.1g



Figure 6.1h



Figure 6.1i

Installing

1. Set the sheet into the area to be installed, lining up all set marks.
2. Lap the material back halfway and spread the adhesive.
3. The Forbo L 885 adhesive must be spread on the wall and cove stick out onto the floor using the proper notch trowel.
4. Material must be laid into the wet adhesive and rolled immediately with a steel seam roller.
5. Make sure that the material is tight to the cove stick and tight underneath the cove cap. Tuck corners into place and roll with a hand roller, making sure proper transfer has been achieved.

Note: There are several ways to cove material. For additional information, contact Forbo Technical Services.



Figure 6.1j



Figure 6.1k

Flash Coving: Marmoleum® & Linoleum

Outside Corner (Figure 6.1l)

1. Using an outside corner scribe and a scrap of material as a guide, mark the excess material and trim on a bevel (45° angle) to the top of the cove stick (Figure 6.1m).
2. Place a straight edge piece of scrap against the miter of the cove stick (Figure 6.1n). Mark all the way out to the straight edge seam of the floor and trim.
3. Cut the “boot” using a square, keeping the marbleization of the material running in the same direction as the flooring (Figure 6.1o). Strip measure for the height of the “boot” fill piece, mark and cut to that height. Cut the length of the “boot” long enough to extend past the corner about 1/2” (Figure 6.1p).
4. Put the “boot” in place and use the outside corner scribe to mark from the cove cap down to the cove stick (Figure 6.1q). Push the material tight into the cove stick and mark the back with a pencil along the radius of the cove (Figure 6.1r).
5. Remove the “boot” and with a hook knife held at a 45° angle, cut the material along the scribe line down to the pencil mark at the radius. Turn the material over and continue to cut on a bevel to the inside of the pencil mark to 3/4 of the way down (Figure 6.1s).
6. Put the “boot” back into place and use the straight edged scrap to complete the cut to the bottom of the miter (Figure 6.1t). Remove the “boot” and spread adhesive on the wall and floor. Install the “boot” and roll with a hand roller.
7. Use the back side of a scrap of material or fine sand paper to remove any burrs on the edges.



Figure 6.1l



Figure 6.1m



Figure 6.1n



Figure 6.1o



Figure 6.1p



Figure 6.1q



Figure 6.1r



Figure 6.1s

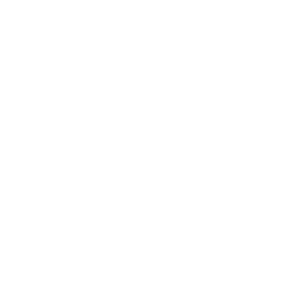


Figure 6.1t

Flash Coving: Vinyl Products

6.2 Flash Coving Vinyl Products

General Installation Guidelines

- Forbo vinyl sheet and solid vinyl tile products may be flash coved. Flash coving is the extension of the flooring material up the wall, usually 4" - 6".

- Pay equal attention to both wall preparation and floor preparation. The flooring material can only be as good as what it covers.

Note: Do not cove the material over non-porous surfaces such as vinyl wallcoverings, marlite, HPL, epoxy paint, etc. without first making sure a proper bond can be achieved.

- Cove sticks may be used when flash coving vinyl products. A cove stick is used where the floor and wall meet to provide support for the back of the floor covering (Figure 6.2a). When a cove stick is not used, special attention must be given to ensure that the floors are flat and the walls are straight and plumb. If the material is forced to conform to irregularities, it will cause a curtaining effect on the coved area.

- Cove sticks are usually made from wood, vinyl, plastic and rubber. Any type can be used provided:

- It must have a minimum radius of 7/8".
- It is hard and rigid. Soft, flexible types will not give adequate support for the flooring.
- It is a material that will not stain the floor covering.

- All corners of the cove stick should be cut with a miter box and saw.

- Cove sticks may be glued or nailed to the wall. If using nails, make sure the nail heads are flush so they will not show through the flooring.

- Cove caps are used to finish off the top edge of the flooring material. Caps are available in metal, vinyl and rubber. The vinyl and rubber caps are available in a wide range of colors and are easier to install. Metal caps are more durable and easier to scribe and fit the flooring to. When using metal caps, it is best to use miter cutters and form wrap around corners.

- Fastening the cove cap to the wall may be accomplished by several different methods, depending on the type of wall surface. The fastest and easiest method, which works on all wall surfaces, is double face foam tape, available through Forbo Flooring.

- When spreading the adhesive for coved vinyls, the adhesive must also be applied to the back of the material that is being coved and allowed to flash off. A 2" paint roller works well to apply the adhesive.

- 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.

- Take pride in your work and be Professional at all times.

- For additional information, contact Forbo Technical Services.

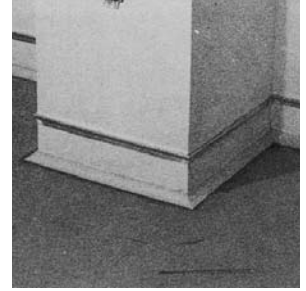


Figure 6.2a

Flash Coving: Vinyl Products

Corners

On vinyls, the preferred method for an outside corner is the “V-plug” or “butterfly” method.

Fold the material back tight along the wall. Using the angle template, cut the material at a 45° angle from the point of the corner (Figure 6.2b). Wrap the material around the corner. Use the template to cut a 90° fill piece from scrap material. Groove the back of the fill piece where it wraps around the corner to aid in forming the corner (Figures 6.2c and 6.2d).

For inside corners, fold the material upon itself tight into the corner. Use the angle template and cut material at a 45° angle (Figure 6.2e). Wrap the material around the corner (Figure 6.2f). Cut off the excess material leaving approximately 1” overlap at the seam. Force the material tight into the corner and base with a stair tool. Trace cut the seam at the 45° angle (Figure 6.2g).

Groove seams with the Forbo Hand Groover and angle template (Figure 6.2h).

Heat weld all seams using a bent tip and welding roller (Figures 6.2i and 6.2j).

After the welding rod has cooled, trim the rod in two passes, using a crescent knife and trim plate or the X-Acto Knife (Figures 6.2k, 6.2l and 6.2m).

A heated smoothing tool may be used to touch up minor irregularities in the finished weld.

Flash Coving ColoRex®

Since it takes time to scribe and cut the border tiles, it is advisable to first spread adhesive only where the full tiles will be laid. When the field is complete, scribe and cut the border tiles before the adhesive is spread. When fitting is complete, adhesive can be spread in the border area and border pieces can be installed and rolled while the adhesive is still wet.

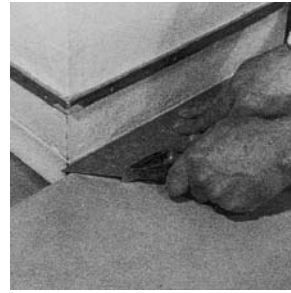


Figure 6.2b

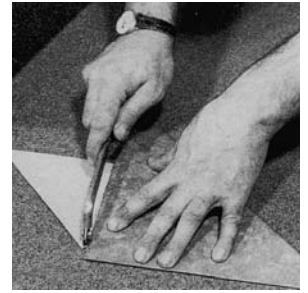


Figure 6.2c

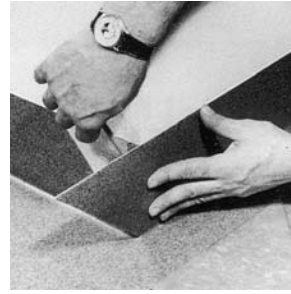


Figure 6.2d

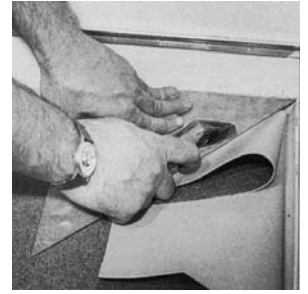


Figure 6.2e

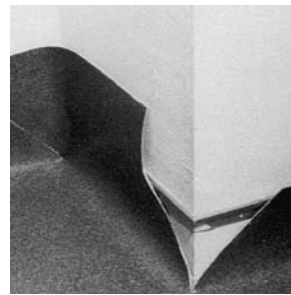


Figure 6.2f



Figure 6.2g

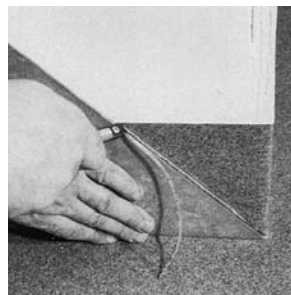


Figure 6.2h



Figure 6.2i



Figure 6.2j

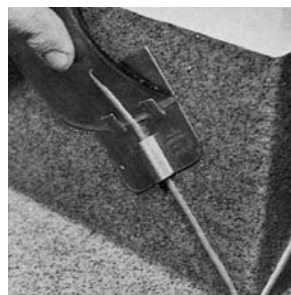


Figure 6.2k

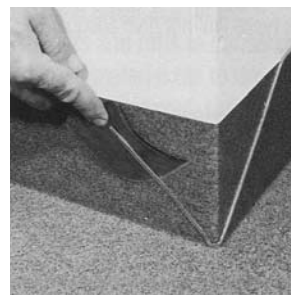


Figure 6.2l



Figure 6.2m

Flash Coving: Flotex® Sheet

6.3 Flash Coving: Flotex® Sheet Products

General Installation Guidelines

- Forbo Flotex® sheet may be flash coved. Flash coving is the extension of the flooring material up the wall, usually 4" - 6".
- Pay equal attention to both wall preparation and floor preparation. The flooring material can only be as good as what it covers.
Note: Do not cove the material over non-porous surfaces such as vinyl wallcoverings, marlite, HPL, epoxy paint, etc. without first making sure a proper bond can be achieved.
- Cove sticks must be used when flash coving Flotex® sheet. A cove stick is used where the floor and wall meet to provide support for the back of the floor covering (Figure 6.3a).
- Cove sticks are usually made from wood, vinyl, plastic and rubber. Any type can be used provided:
 - It must have a minimum radius of 1".
 - It is hard and rigid. Soft, flexible types will not give adequate support for the flooring.
 - It is a material that will not stain the floor covering.
- All corners of the cove stick should be cut with a miter box and saw.
- Cove sticks may be glued or nailed to the wall. If using nails, make sure the nail heads are flush so they will not show through the flooring.
- Cove caps are used to finish off the top edge of the flooring material. Caps are available in metal, vinyl and rubber. The vinyl and rubber caps are available in a wide range of colors and are easier to install. Metal caps are more durable and easier to scribe and fit the flooring to. When using metal caps, it is best to use miter cutters and form wrap around corners.
- Fastening the cove cap to the wall may be accomplished by several different methods, depending on the type of wall surface. The fastest and easiest method, which works on all wall surfaces, is double face foam tape, available through Forbo Flooring.
- 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.
- Take pride in your work and be Professional at all times.
- For additional information, contact Forbo Technical Services.

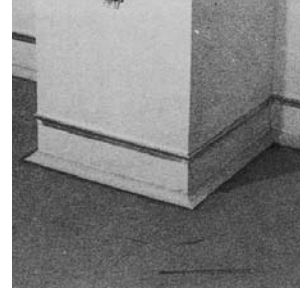


Figure 6.3a

Installing Flash Cove

1. When flash coving Flotex®, it is important to remember that the material is engineered NOT to stretch and that it will not conform to undulations in the floor or wall. If crooked or wavy floors or walls are not adequately repaired, the Flotex® may not lay flat against the substrate.
2. Use Forbo FRS 885 adhesive and "double stick" the vertical surfaces.

Repairs

7. Repairs

Marmoleum® & Linoleum Products

- Cigarette burns and small scratches may be repaired using a fine grade steel wool (00 or 000 grade). Rub the damaged area, making sure to rub with the grain until damage is removed. Apply floor finish with a clean cloth to repaired area.
- To repair small gouges and voids, a paste made from a small scrap of material may be used. The paste is made by scraping the surface of a scrap piece of material using a paint scraper or knife. Take the scrapings and grind them together to make a fine powder. Mix the powder with white glue to form a paste. Fill the gouge with the paste, making sure to have an excess that, once dry, can be sanded even with the floor surface using steel wool. Apply floor finish to repaired area.
- Large gouges or torn areas may be repaired by plugging with a new piece of material. Plugs in the shape of a fish eye or diamond running with the marbleization will be less noticeable. Match marbleization of plug as close as possible to that of area to be repaired. Install new piece using proper adhesive and roll with a seam roller. Apply floor finish to repaired area.

Vinyl Sheet

- Minor cigarette burns may be repaired by first scraping away the charred material. Next, apply a few drops of vinyl seam sealer, allow the seam sealer to soften the vinyl, scrape again to remove the remainder of the charred material. Fill in damaged area with seam sealer and allow to dry.
- Minor tears may be repaired by cleaning the damaged area with a clean, white rag and some solvent and then apply a PVC flooring seam sealer.
- Large gouges or torn areas may be repaired by plugging with a new piece of material. Plugs in the shape of a triangle, fish eye or diamond will be less noticeable. Install a new piece with proper adhesive and roll with seam roller. Apply chemical weld seam sealer in seams, if flooring is in wet area or clean room the seams should be heat welded.

Vinyl Tile

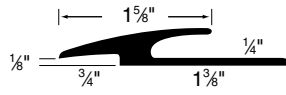
- Most minor scratches and stains may be sanded off surface using fine sand paper and steel wool, buff with a buffing pad.
- Larger gouges or holes may be filled by heat welding a piece of the tile into the gouge, let cool, then sand smooth the surface with orbital sander then buff with a buffing pad.

Accessories & Tools

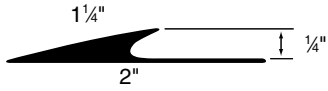
8.1 Installation Accessories



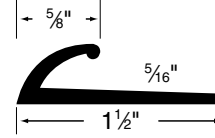
ACC01
Tile-Carpet Joiner 1/8"
20 pieces/carton, Length: 12'



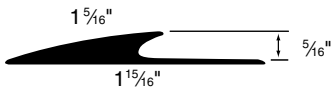
ACC12
Resilient-Carpet Joiner
20 pieces/carton, Length: 12'



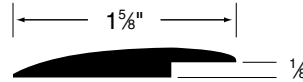
ACC02
Carpet Reducer 1/4"
20 pieces/carton, Length: 12'



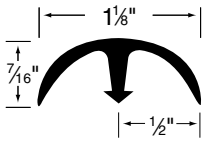
ACC13
Carpet Cove Cap
20 pieces/carton, Length: 12'



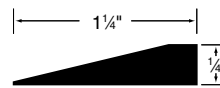
ACC03
Carpet Reducer 5/16"
20 pieces/carton, Length: 12'



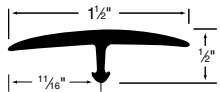
ACC14
Underslung Reducer
20 pieces/carton, Length: 12'



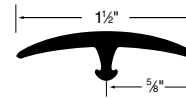
ACC04
Snap-Down Divider 1 1/8"
20 pieces/carton, Length: 12'



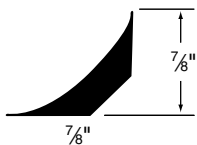
ACC15
Reducer Strip 1/4"
20 pieces/carton, Length: 12'



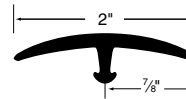
ACC05
Snap-Down Divider 1 1/2"
20 pieces/carton, Length: 12'



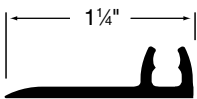
ACC16
Snap-Down Divider Low Profile 1 1/2"
20 pieces/carton, Length: 12'



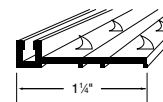
ACC06
Cove Stick (natural color only)
20 pieces/carton, Length: 12'



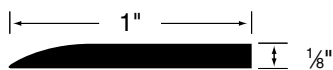
ACC17
Snap-Down Divider 2"
20 pieces/carton, Length: 12'



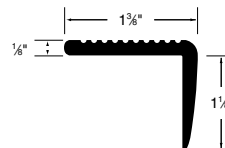
ACC07M
Pinless Metal Track
(aluminum finish, no color)
20 pieces/carton, Length: 12'



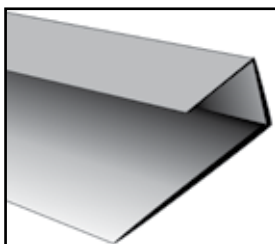
ACC18M
Metal Track with Pins
(aluminum finish, no color)
20 pieces/carton, Length: 12'



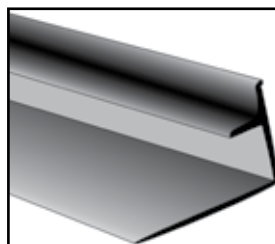
ACC09
Tile Reducer Strip 1/8"
50 pieces/carton, Length: 3'



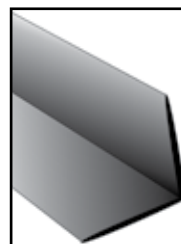
ACC20
Stair Nosing
20 pieces/carton, Length: 12'



"J" Molding: Used for finishing any exposed edge.



Inside Corner Molding: Used for finishing edges at inside corners.



Outside Corner Molding: Used for protecting and finishing edges at outside corners.



"T" Molding: Used for finishing exposed edges.

Accessories & Tools

8.2 Tools

Scribers, Scriber Pins and Scriber Blades



T101 Long Scriber: Used for accurately scribing vinyl and linoleum products. The Long Scriber can be fitted with either a scribe pin or a scribe blade (both included).



T102 Short Scriber: Used for underscribing seams and inlays in vinyl and linoleum products. The short scriber can be fitted with either a scribe pin or a scribe blade (both included).



T149 Scribe Pins: Replacement pins for the Long Scriber and Short Scriber (0.063" diameter x 1.590" with brass head). Available in packs of 100 or packs of 25 (T149.25).



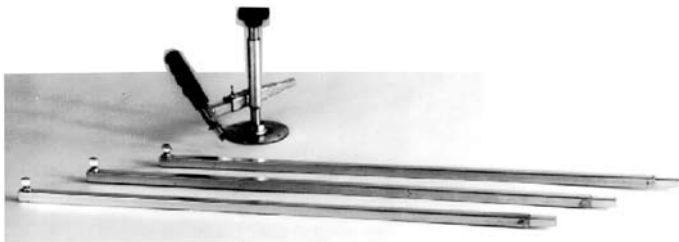
T150.25 Scribe Pins: Replacement pins for the Long Scriber, Short Scriber and Circle Maker (0.058" diameter x 0.063"). Available in packs of 25.



T156 Long Scriber Blades: Replacement pins for the Long Scriber and Circle Maker (0.058" diameter x 0.063"). Available in packs of 6.



T157 Pointed Scriber Blades: Replacement blades for the Short Scriber (0.240" wide x 1.063" long x 0.52" thick). Available in packs of 5.



T204 Circle Maker & Extensions: Used to scribe or groove circles from 6" to 19' 6" in diameter in vinyl and linoleum products. Three extension poles are included. The Circle Maker can be fitted with a scribe pin, scribe blade, groover blade or slotted carpet knife blade (pins and blades not included).

Accessories & Tools

8.2 Tools

Groovers, Trimmers and Blades



T133 Forbo Groover: A push groover used for correctly grooving out seams in linoleum and homogeneous vinyl for heat welding. It uses the T206 blade, which is the same blade used for the hand groovers for a consistent groove throughout.



T202 Straight Hand Groover: Used to groove seams on coving, corners and hard to reach areas. It uses with the T206 blade.



T105 Thermo Groover: Used in conjunction with a welding gun for grooving.



T212 X-Acto Knife: Used for grooving material as well as trimming welding rod on inside and outside flashcovered corners. It can be used with T213 Round Blades, T214 Diamond Blades or T215 Square Blades (blades not included).



T116 Spare Groover Blades: Used with the Forbo Groover, Bent Hand Groover, Straight Hand Groover and Circle Maker. Available in packs of 10.



T213 X-Acto Knife Blades: Round blades used with X-Acto Knife.



T214 X-Acto Knife Blades: Diamond blades used with X-Acto Knife.



T215 X-Acto Knife Blades: Square blades used with X-Acto Knife.

Accessories & Tools

8.2 Tools

Groovers, Trimmers and Blades



T117 Crescent Shaped Knife: Used for trimming welding rod flush with the flooring surface. It is also used in conjunction with the Trim Plate.



T118 Trim Plate: Used for the first trimming on heat welds. The Crescent Shaped Knife slides into the Trim Plate.



T131 Pajarito Knife: Used for trimming heat weld on Eternal Step SR studded.

Cutters and Blades



T103 Forbo Seam and Strip Cutter: Designed to score and trim the factory edges of linoleum products, leaving the appropriate bevel (undercut) easily and accurately in one step. It can be adjusted to any gauge of material from 2.0 mm up to 6.0 mm. It comes with three spacers to trim 10, 15, 20 or 30 mm strips. It uses Straight or Hooked Blades.



B100 Straight Blade: Blade used with the Forbo Seam and Strip Cutter. Available in packs of 20.



B300 Hooked Blade: Blade used with the Forbo Seam and Strip Cutter. Available in packs of 20.

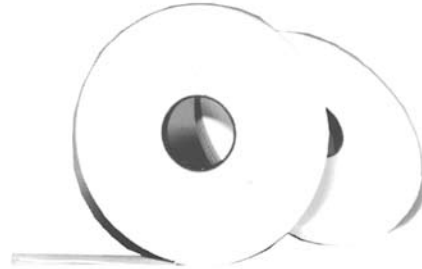
Accessories & Tools

8.2 Tools

Other Installation Tools



T600 Insertable Blade Trowel: Used in conjunction with trowel blades to spread adhesive when installing resilient floor covering. Blades are included with all four gallon pails of adhesive. This is also available in a left-handed model (T600L).



T209 Double Faced Foam Tape: Used to install cove cap on concrete, metal and sheetrock walls quickly and easily. Available in rolls 1/2" wide x 108' long.



T210 pH Paper: Used to test the acidity or alkalinity of concrete slabs. This test is done prior to installing the floor covering. Available in packs of 100 strips.



T625.03 Calcium Chloride Moisture Test Kit: Used to accurately test the rate of moisture dispersion from the concrete slab. One test should be conducted for every 1,000 square feet of flooring. Available in packs of 3.

LIMITED 5-YEAR COMMERCIAL WARRANTY

Limited Warranty. Forbo warrants that its products, when installed using Forbo's recommended procedures and adhesives, shall perform in accordance with their published specifications and shall be free from manufacturing defects under normal use for a period of five (5) years from the date of original installation. THIS IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY FORBO, AND FORBO MAKES NO OTHER WARRANTY, EITHER EXPRESS OR IMPLIED, OR ANY KIND INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This limited warranty shall extend only to the original purchaser or original end-user and is not assignable.

Limitation of Remedies. Forbo's only obligation hereunder will be to deliver to the original purchaser or original end-user, free of charge, sufficient material of same or similar quality to replace the defective product, provided that if a warranty claim is made within one year after installation and if the warranty claim is not based on visual defects that could have been seen before the installation, Forbo will also assume reasonable installation costs of the replacement product. No labor cost will be covered on claims made later than one (1) year after date of original installation. Subject to the foregoing exception, FORBO SHALL HAVE NO OBLIGATION TO REMOVE ANY DEFECTIVE PRODUCT OR TO INSTALL ANY REPLACEMENT PRODUCT FOR ANY COSTS OF REMOVAL OR INSTALLATION, WHICH SHALL BE THE SOLE RESPONSIBILITY OF PURCHASER OR END-USER. Replacement will be provided only after Forbo's inspection of the product and its agreement to the defective condition. Forbo and its representatives must be permitted reasonable access to facilities for the inspection and testing of the product. All claims for defect shall be deemed waived unless made in writing delivered to Forbo or your Forbo Distributor during the warranty period and not later than thirty days after discovery of the defect. Purchaser and end-user have the sole responsibility to properly install and maintain the products. Forbo shall have no obligation to replace any product which has been subjected to misuse, neglect, accident or abuse, or which has not been installed or maintained in accordance with Forbo's written instructions, or which has been exposed to undue wear and tear, excessive moisture, alkali or acids. In addition to the foregoing limitations, Forbo's limited replacement warranty shall not cover surface stains including asphalt, driveway sealer, and carpet dye, dissatisfaction due to improper maintenance or installation, damage from improper maintenance or usage or general misuse including, without limitation, burns, cuts, tears, scratches, scuffs, indentation damage from high heels, rolling loads, improperly casted chairs, failure to use recommended floor protectors and the like, damage or discoloration from adhesives or maintenance products not recommended by Forbo, extended direct exposure to sunlight, moisture, alkaline, hydrostatic pressure damage from the subfloor, mold or mildew, installation over gypsum cement underlayments or lightweight aggregate concrete, or difference in color between samples or photographs and the actual flooring. THE CORRECTION OF SUCH DEFECTS BY REPLACEMENT IN THE MANNER SET FORTH ABOVE SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY HEREUNDER AND FULFILLMENT OF ALL THE OBLIGATIONS OF FORBO WITH RESPECT TO THE LIMITED WARRANTY GIVEN HEREIN. This exclusive and limited remedy shall not fail of its essential purpose by reason of timeliness, causes beyond Forbo's reasonable control or the general concerns of purchaser or end-user.

Limitation of Liability. Forbo's total, complete and exclusive liability hereunder shall be limited to replacement of defective product as provided herein and shall not exceed the value of the defective product furnished. Purchaser and end-user waive all other remedies, warranties and liabilities of any kind, express or implied, whether arising by operation of law or otherwise. FORBO SHALL NOT BE LIABLE FOR LOSS OF PROFITS, DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR OTHER DAMAGES UNDER THIS LIMITED WARRANTY OR FROM ANY CAUSE WHATSOEVER, WHETHER BASED UPON WARRANTY, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE. Forbo shall be entitled to legal fees, costs and expenses in defending and enforcing this clause against purchaser, end-user and others.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

If you experience any problem with a Forbo product, please contact the contractor who installed the material to help identify whether the problem is related to manufacturing, installation or maintenance. Retain all information and documents until the problem is resolved.

If the problem is manufacturing related and you are not satisfied with the contractor's response, please notify in writing Forbo Technical Services and explain the problem thoroughly:

Forbo Flooring, Inc.
ATTN: Technical Services
Humboldt Industrial Park, Maplewood Drive
P.O. Box 667
Hazleton, Pennsylvania 18202
570-459-0771

After Forbo is so notified, Forbo reserves the right to have an authorized Forbo representative inspect and verify the defect to determine whether replacement will be provided under the terms of this limited warranty. If Forbo disagrees with the claim, Forbo reserves the right to submit the matter to arbitration by a qualified disinterested third party.

This limited warranty may not be extended, altered or waived except in writing signed by any authorized officer of Forbo. Any action for breach hereunder must be commenced within one year after the cause of action has accrued. The limitation of remedies and limitation of liabilities under this limited warranty shall extend and apply to Forbo Flooring, Inc. and its affiliated companies. All claims for warranty coverage under this limited warranty shall be made solely to Forbo Flooring, Inc. in accordance with the terms of this limited warranty. This limited warranty shall be construed and enforced in accordance with the laws of the Commonwealth of Pennsylvania without regard to conflicts of laws.

LIMITED 10-YEAR FLOTEX® WARRANTY

Limited Flotex® Warranty. Forbo warrants that Flotex® sheet and tile products, when installed using Forbo's recommended procedures and adhesives, shall perform in accordance with their published specifications and shall be free from manufacturing defects under normal use for a period of ten (10) years from the date of original installation. This limited 10-year warranty protects against wear, static, edge ravel, delamination and wear layer zippering (wet or dry). THIS IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY FORBO, AND FORBO MAKES NO OTHER WARRANTY, EITHER EXPRESS OR IMPLIED, OR ANY KIND INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This limited warranty shall extend only to the original purchaser or original end-user and is not assignable.

Limitation of Remedies. Forbo's only obligation hereunder will be to deliver to the original purchaser or original end-user, free of charge, sufficient material of same or similar quality to replace the defective product, provided that if a warranty claim is made within one year after installation and if the warranty claim is not based on visual defects that could have been seen before the installation, Forbo will also assume reasonable installation costs of the replacement product. No labor cost will be covered on claims made later than one (1) year after date of original installation. Subject to the foregoing exception, FORBO SHALL HAVE NO OBLIGATION TO REMOVE ANY DEFECTIVE PRODUCT OR TO INSTALL ANY REPLACEMENT PRODUCT FOR ANY COSTS OF REMOVAL OR INSTALLATION, WHICH SHALL BE THE SOLE RESPONSIBILITY OF PURCHASER OR END-USER. Replacement will be provided only after Forbo's inspection of the product and its agreement to the defective condition. Forbo and its representatives must be permitted reasonable access to facilities for the inspection and testing of the product. All claims for defect shall be deemed waived unless made in writing delivered to Forbo or your Forbo Distributor during the warranty period and not later than thirty days after discovery of the defect. Purchaser and end-user have the sole responsibility to properly install and maintain the products. Forbo shall have no obligation to replace any product which has been subjected to misuse, neglect, accident or abuse, or which has not been installed or maintained in accordance with Forbo's written instructions, or which has been exposed to undue wear and tear, excessive moisture, alkali or acids. In addition to the foregoing limitations, Forbo's limited replacement warranty shall not cover surface stains including asphalt, driveway sealer, and carpet dye, dissatisfaction due to improper maintenance or installation, damage from improper maintenance or usage or general misuse including, without limitation, burns, cuts, tears, scratches, scuffs, indentation damage from high heels, rolling loads, improperly casted chairs, failure to use recommended floor protectors and the like, damage or discoloration from adhesives or maintenance products not recommended by Forbo, extended direct exposure to sunlight, moisture, alkaline, hydrostatic pressure damage from the subfloor, mold or mildew, installation over gypsum cement underlayments or lightweight aggregate concrete, or difference in color between samples or photographs and the actual flooring. THE CORRECTION OF SUCH DEFECTS BY REPLACEMENT IN THE MANNER SET FORTH ABOVE SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY HEREUNDER AND FULFILLMENT OF ALL THE OBLIGATIONS OF FORBO WITH RESPECT TO THE LIMITED WARRANTY GIVEN HEREIN. This exclusive and limited remedy shall not fail of its essential purpose by reason of timeliness, causes beyond Forbo's reasonable control or the general concerns of purchaser or end-user.

Limitation of Liability. Forbo's total, complete and exclusive liability hereunder shall be limited to replacement of defective product as provided herein and shall not exceed the value of the defective product furnished. Purchaser and end-user waive all other remedies, warranties and liabilities of any kind, express or implied, whether arising by operation of law or otherwise. FORBO SHALL NOT BE LIABLE FOR LOSS OF PROFITS, DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR OTHER DAMAGES UNDER THIS LIMITED WARRANTY OR FROM ANY CAUSE WHATSOEVER, WHETHER BASED UPON WARRANTY, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE. Forbo shall be entitled to legal fees, costs and expenses in defending and enforcing this clause against purchaser, end-user and others.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

If you experience any problem with a Forbo product, please contact the contractor who installed the material to help identify whether the problem is related to manufacturing, installation or maintenance. Retain all information and documents until the problem is resolved.

If the problem is manufacturing related and you are not satisfied with the contractor's response, please notify in writing Forbo Technical Services and explain the problem thoroughly:

Forbo Flooring, Inc.
ATTN: Technical Services
Humboldt Industrial Park, Maplewood Drive
P.O. Box 667
Hazleton, Pennsylvania 18202
570-459-0771

After Forbo is so notified, Forbo reserves the right to have an authorized Forbo representative inspect and verify the defect to determine whether replacement will be provided under the terms of this limited warranty. If Forbo disagrees with the claim, Forbo reserves the right to submit the matter to arbitration by a qualified disinterested third party.

This limited warranty may not be extended, altered or waived except in writing signed by any authorized officer of Forbo. Any action for breach hereunder must be commenced within one year after the cause of action has accrued. The limitation of remedies and limitation of liabilities under this limited warranty shall extend and apply to Forbo Flooring, Inc. and its affiliated companies. All claims for warranty coverage under this limited warranty shall be made solely to Forbo Flooring, Inc. in accordance with the terms of this limited warranty. This limited warranty shall be construed and enforced in accordance with the laws of the Commonwealth of Pennsylvania without regard to conflicts of laws.



Forbo Flooring Systems
North American Headquarters
8 Maplewood Drive
Humboldt Industrial Park
Hazleton, PA 18202
1-800-842-7839
Fax: 570-450-0258
info.na@forbo.com
www.forboflooringNA.com
www.floorcostcomparison.com

Forbo Flooring Systems
Canada Office
3220 Orlando Drive
Mississauga, ON L4V 1R5
1-866-661-2351
Fax: 416-661-5362
info.na@forbo.com
www.forboflooringNA.com
www.floorcostcomparison.com

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