Linoleum Sheet

Installation Systems

COMMERCIAL USE					
Product	Gauge	ADHESIVE AND SEAMING OPTIONS			
		Full Spread with S-780 and Heat Welded Seams	S-240 in Static and Dynamic Load Areas and Heat Welded Seams*	Full Spread with S-780 and S-761 at Seams	May Flash Cove
MARMORETTE	0.080″ (2.0 mm) 0.100″ (2.5 mm) 0.125″ (3.2 mm)	Highly Recommended	Highly Recommended	Optional	Yes
GRANETTE COLORETTE UNI WALTON	0.100″ (2.5 mm) 0.125″ (3.2 mm)				
LINORETTE	0.100″ (2.5 mm)				

** It is necessary to smooth out the adhesive trowel ridges of the S-240 Epoxy Adhesive using a 3/16" (4.8 mm) nap paint roller. The purpose of this is to create a uniform application of the S-240 Epoxy Adhesive.*

Installation:

Location:	All grade levels
Pattern Match:	No; do not reverse pieces
Seam Method:	Recess scribe
Seam Treatment:	Heat weld or S-761 Seam Adhesive
Fitting:	All methods

Suitable Substrates:

All suitable substrates listed below must be properly prepared and meet the requirements discussed in Chapter 3, Subfloors and Underlayments. There may be other exceptions and special conditions for these substrates to be suitable for the Linoleum Sheet Flooring Installation Systems.

- Concrete (on all grade levels)
- Approved Suspended Wood
- Existing Resilient Floors
- Steel, Stainless Steel, Aluminum, Lead, Copper, Brass
- Ceramic Tile, Terrazzo, Marble
- Polymeric Poured (seamless) Floors

Job Conditions/Preparation:

- Resilient flooring should only be installed in temperature-controlled environments. It is necessary to maintain a constant temperature before, during and after the installation. Therefore, the permanent or temporary HVAC system must be in operation before the installation of resilient flooring. Portable heaters are not recommended as they may not heat the room and subfloor sufficiently. Kerosene heaters should never be used.
- Substrates must be dry, clean, smooth and free from paint, varnish, wax, oils, solvents and other foreign matter.
- In renovation or remodel work, remove any existing adhesive residue* so that 100% of the overall area of the original substrate is exposed.
- Allow all flooring materials and adhesives to condition to the room temperature for a minimum of 48 hours before starting the installation. Do not place in direct sunlight.

** Some previously manufactured asphaltic "cutback" adhesives contain asbestos For removal instructions, refer to the Resilient Floor Covering Institute's publication Recommended Work Practices for Removal of Resilient Floor Coverings.*

- The area to receive the resilient flooring should be maintained at a minimum of 65°F (18°C) and a maximum of 100°F (38°C) for 48 hours before, during and for 48 hours after completion. **When using S-240 Epoxy Adhesive, the maximum room temperature should not exceed 85°F (29°C)**.
- During the service life of the floor, the temperature should never rise above 100°F (38°C) nor fall below 55°F (13°C). The performance of the flooring material and adhesives can be adversely affected outside this temperature range.
- For concrete substrates, conduct moisture testing (moisture vapor emission rate [MVER]) and/or percent relative humidity (in-situ probe). Bond tests must also be conducted for compatibility with the substrate. Please refer to Chapter 3, Subfloors and Underlayments.
- Radiant-heated substrates must not exceed a maximum surface temperature of 85°F (29°C).
- Concrete floors should be tested for alkalinity. The allowable readings for the installation of Armstrong flooring are 5 to 9 on the pH scale.

Precautions:

- Linoleum will grow slightly in the width and shrink slightly in the length of the material when placed into the wet adhesive. Following the recommended installation procedures will help compensate for this movement.
- Do not install over existing on-grade or below-grade tile.
- Heat welding is optional, but required in areas exposed to direct sunlight, topical moisture and/or temperature fluctuations and when installed over radiant heated subfloors.
- Heat Welding: see Chapter 7.
- Flash Coving: see Chapter 8.

Fitting:

When installing several rolls in one area, make certain the batch numbers are the same. Also read the sequence numbers and install rolls that are within 20 numbers of each other. Install the rolls in sequential order.

Keep all material rolled face-out until ready to begin the installation. Pieces that are cut and fit in the morning should be adhered that morning. Pieces that are cut and fit in the afternoon should be adhered that afternoon.

Before installing the material, plan the layout so seams fall at least 6" (15.2 cm) away from subfloor/underlayment joints and saw cuts/construction joints in concrete. Do not install over expansion joints. When installing over an existing resilient floor, plan the layout so the new seams are a minimum of 6" (15.2 cm) away from the original seams. When installing over tile, seams should fall in the center of the tile.

Recommended fitting procedures include straight scribing, pattern scribing and freehand knifing. The lines on the back of the linoleum represent trademark edges.

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

Adhesive Open Times and Trowel Notchings

Adhesive	Porous	Nonporous
S-780	**Open Time:** Set in wet, no open time **Regular Notch:** 1/16" (1.6 mm) deep, 1/16" (1.6 mm) wide, 3/32" (2.4 mm) apart	**Open Time:** 5-10 minutes **Regular Notch:** 1/16" (1.6 mm) deep, 1/16" (1.6 mm) wide, 3/32" (2.4 mm) apart
S-580 **Brush-On or Roll-On***	**Open Time:** Miminum of 20–30 minutes **Brush-On or Roll-On**	**Open Time:** Minimum of 20–30 minutes **Brush-On or Roll-On**
S-240	**Open Time:** Approximately 10–20 minutes **Fine Notch:** 1/32" (0.8 mm) deep, 1/16" (1.6 mm) wide, 5/64" (2 mm) apart	**Open Time:** Approximately 10–20 minutes **Fine Notch:** 1/32" (0.8 mm) deep, 1/16" (1.6 mm) wide, 5/64" (2 mm) apart

** Apply two coats of S-580 Flash Cove Adhesive with a brush or roller 4" (10.2 cm) onto the floor as well as up the entire cove area. Allow adhesive to dry to a pressure-sensitive state between applications. The S-580 has unlimited working time.*

NOTE: Over porous substrates, install the material into the adhesive immediately after spreading. Over nonporous substrates, allowing the proper open time will help to minimize knee marks, roller marks and trapped air blisters. The amount of open time will vary according to job conditions, temperature, humidity, air flow and type of substrate. **Initial blisters are caused by inadequate open time and will begin to show within one hour after rolling.**

Procedure:

See Chapter 5, Adhesives, Trowel Notchings, and Seam Treatments.

■ **Full Spread S-780:**

1. Before installing the material, plan the layout so seams fall at least 6" (15.2 cm) away from underlayment joints, seams in existing resilient flooring and/or saw cuts in concrete. Do not install over expansion joints.
2. Cut pieces from the roll to the specified length, allowing enough material at each end to flash 1-1/2" (31.8 mm) up the wall for fitting.
3. Recommended fitting procedures include freehand knifing, pattern scribing and straight scribing methods.
4. Fit piece #1 and position in the room.
5. Prepare the seam edge by trimming the factory seam edge using an edge trimmer.
6. Draw a pencil line on the subfloor along the length of the trimmed factory edge.
7. Carefully lap the material back halfway to expose the subfloor.
8. Starting at the lap point and working toward the end wall, apply the Armstrong S-780 Adhesive up to the pencil line using the regular notching of the Armstrong S-891 Trowel.
9. Allow the recommended open time before placing the material into the adhesive. Use extreme care when positioning the flooring over the Armstrong S-780 Adhesive, which has a firm grab and does not allow repositioning.
10. Starting at the center and working toward the edges, roll the material in two directions using a 100-lb. roller, staying 2" (5.1 cm) away from the seam. Clean adhesive residue from the surface of the flooring using a clean, white cloth dampened with a neutral detergent and water.
11. Repeat steps #7 through #10.
12. Cut piece #2, allowing enough material at each end to flash 1-1/2" (31.8 mm) up the wall for fitting.
13. **Install pieces as recommended, TM edge to TM edge or TM edge to non-TM edge**.
14. Overlap piece #2 onto piece #1 approximately 1/2" (12.7 mm). Prepare the seam edge on the opposite side of the sheet by trimming the factory seam edge using an edge trimmer.
15. Draw a pencil line on the subfloor along the length of the trimmed factory edge.
16. Carefully lap the material back halfway to expose the subfloor.
17. Starting at the lap point and working toward the end wall, apply the Armstrong S-780 Adhesive up to the pencil line using the regular notching of the Armstrong S-891 Trowel.
18. Allow the recommended open time before placing the material into the adhesive. Use extreme care when positioning the flooring over Armstrong S-780 Adhesive, which has a firm grab and does not allow repositioning.
19. Starting at the center and working toward the edges, roll the material in two directions using a 100-lb. roller staying 2" (5.1 cm) away from the seam. Clean adhesive residue from the surface of the flooring using a clean white cloth dampened with a neutral detergent and water.
20. Repeat steps #16 through #19 for the remaining half of piece #2.
21. Recess scribe the seam using a recess scriber. When heat welding, seams may be recess scribed slightly open [1/64" (0.4 mm)] to make guiding the router easier. When using S-761 Seam Adhesive, cut the seams net.
22. Before cutting the seam, protect the floor by inserting a piece of scrap material beneath the scribe mark. With the scrap on the same side as the cutting hand, cut the seam holding a straight blade knife straight up and down.
23. When using S-761 Seam Adhesive option cut seams net.
    a. Cut the tip of the Armstrong S-761 Seam Adhesive applicator bottle and apply a continuous 1/8" (3.2 mm) bead of S-761 Seam Adhesive along the seam edge of piece #1.
    b. Tuck the seam edge into place, forcing the Armstrong S-761 Seam Adhesive up through the seam.
    c. Clean adhesive residue from the surface of the flooring using a clean white cloth dampened with a neutral detergent and water.
    d. Refer to Chapter 7, Seams, S-761 Seam Adhesive Procedure for more detail.

24. Roll the seam into place using a hand roller and roll again with a 100-lb. roller.
25. Follow the same procedures for the remaining pieces, completing one piece at a time until the job is finished.
26. When heat welding seams, heat weld seams as recommended. Refer to Chapter 7, Seams, Heat Welded Seams for more detail.
27. Do not allow traffic on the flooring for 24 hours after installation.
28. Newly installed flooring should not be exposed to rolling load traffic for at least 72 hours after installation to allow setting and drying of the adhesive.

- **Concentrated Static and Dynamic Loads with Linoleum and S-240 Epoxy Adhesive:**

Product Performance under Concentrated Static and Dynamic Loads

Armstrong Commercial Sheet Flooring is used in many applications where it is subjected to heavy static and dynamic loads. Some furnishings, appliances and equipment in certain environments may be equipped with wheels, casters, rests or other floor contact devices, which concentrate rather than distribute the load over the surface of the flooring. Hospital patient beds and operating room tables are typical examples. With respect to portable furnishings and equipment, while concentrated wheel/caster loadings provide for easier mobility, they can be particularly damaging to resilient flooring installations. Armstrong recommends that any furnishings or equipment be fitted with floor contact devices, which avoid concentrating weight loads.

Our experience has shown that the use of hard-setting reactive adhesives, like our Armstrong S-240 Epoxy Adhesive, offer advantages that may help protect against damage (such as delamination) when used to install flooring under such furnishings and equipment. Depending on the application, the epoxy may only be necessary in limited areas of any particular installation, such as an area immediately underneath and adjacent to the primary areas of contact with the flooring. In the case of certain heavy hospital beds, the application of the epoxy adhesive in an area that extends a minimum of 1' beyond the wheel base or footprint of the four casters [approximately 4' x 8' (1.2 m x 2.4 m)] may be sufficient.

1. Plan layout of the Armstrong S-240 Epoxy Adhesive so it extends approximately 1' beyond the load area. Use the S-780 Linoleum Adhesive in all other areas.
2. Mix the entire contents of Part A and Part B together with a stirring motion while at the same time lifting from the bottom. Mix thoroughly for 3 to 5 minutes to a uniform color. **Do not over mix.** Never mix Armstrong S-240 Epoxy Adhesive on the subfloor surface.
3. **Immediately pour the entire unit of mixed adhesive onto the substrate**. **Do not leave mixed adhesive in cans, as this shortens the pot life and working time and may generate excessive heat.** Maximum pot life of Armstrong S-240 Epoxy Adhesive is approximately 15 minutes, depending on temperature and humidity.
4. Apply Armstrong S-240 Epoxy Adhesive with the recommended trowel notching.
5. After troweling of the Armstrong S-240 Epoxy Adhesive, allow 10–20 minutes open time before placing the flooring into the adhesive. **Do not allow the Armstrong S-240 Epoxy Adhesive to dry completely.**
6. Using a 3/16" (4.8 mm) nap paint roller, wet out the 3/16" (4.8 mm) nap paint roller by rolling it on a piece of scrap material that contains the S-240 Epoxy Adhesive. This will prevent the removal of already applied S-240 Epoxy Adhesive when rolling.
7. Carefully roll out the S-240 Epoxy Adhesive trowel ridges using the 3/16" (4.8 mm) nap paint roller, creating a uniform application of the S-240 Epoxy Adhesive.
8. When using Armstrong S-240 Epoxy Adhesive in conjunction with the recommended Armstrong Full Spread Adhesive, plan out the open times so that the flooring may be placed into both adhesives at the same time. Working time of Armstrong S-240 Epoxy Adhesive is 60 minutes.
9. After allowing the proper open time, carefully place the flooring into the Armstrong S-240 Epoxy Adhesive to ensure that air bubbles are not trapped beneath the flooring.
10. Within 30 minutes of the Armstrong S-240 application, roll the material using a 100-lb. roller. Starting at the center and working toward the edges, roll the material in the direction of the trowel notches and then again in the opposite direction [staying 2" (5.1 cm) away from any seams]. Do not work on newly adhered flooring except to roll; if necessary, use a kneeling board.
11. Clean any adhesive residue from the surface of the flooring using a clean white cloth dampened with a neutral detergent and water. **Dried Armstrong S-240 Epoxy Adhesive cannot be removed.**
12. Repeat rolling procedure at 1 hour and 2 hours after the initial application of Armstrong S-240 Epoxy Adhesive.

13. **Seams must be heat-welded. Wait a minimum of 10 hours before heat welding.**
14. Do not allow traffic on the flooring for 24 hours after installation. Newly installed flooring should not be exposed to rolling load traffic for at least 72 hours after installation to allow setting and drying of the adhesive.

- **Decorative Borders and Insets:**

1. Accurately measure and mark the position of the border on the subfloor. Using a pencil, trace around the borders and/or insets.
2. Apply the S-780 Adhesive up to the pencil line. Allow the proper open time before placing the material into the adhesive. If necessary, weigh down the border or inset.
3. Carefully roll using a hand roller and a 100-lb. roller.
4. Install the field material in the normal manner.
5. Carefully cut the field material so it overlaps the border and/or inset. Recess scribe the seam between the field and the border and/or inset using a recess scriber.
6. Insert a piece of scrap material beneath the scribe mark. With the scrap on the same side as the cutting hand, cut the seam holding a straight blade knife straight up and down. Roll the seam into place before the adhesive dries using a hand roller and then roll again using a 100-lb. roller.
7. If heat welding the seams, follow the recommendations for heat welding linoleum seams.

Linoleum Color Change:

"Drying room yellowing" sometimes referred to as "seasoning bloom," "drying room film" or "stove yellowing" is a natural phenomenon that occurs during the manufacturing process of all linoleum. As linoleum cures in the drying room, a yellowish cast may develop on the surface due to the oxidation of the linseed oil. This is not a product defect. Any change in the product's appearance because of this yellow cast is temporary and disappears after exposure to either natural or artificial light. The time required for the yellow cast to disappear ranges from a few hours to several weeks depending on the type and intensity of the light source. Typically, the yellow cast disappears more quickly with exposure to natural light. The application of floor finishes will not interfere with the dissipation of the yellow cast. Disappearance of the yellow cast will not occur on areas not exposed to light.