SofTILE KrosLOCK

Installation Procedures

SofTILE® Installation Procedures

February 2005

PAGE

PAGE

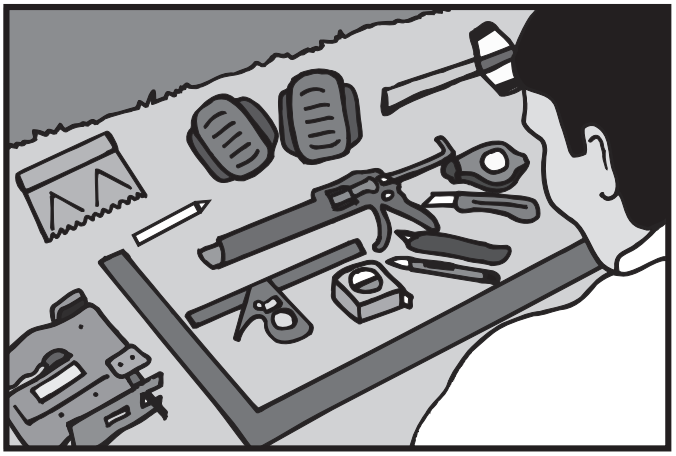
Product Storage

1. Adhesive - ***Above 50°F***
Store all manufacturer supplied adhesives in a dry storage area at temperatures above 50°F.

2. SofTILE®
To ensure that the product is dry and above 50°F at installation time, the tiles should be stored in a location with temperatures above 50°F for at least 72 hours prior to the installation date. Tiles that will be stored for a long period of time prior to installation should be stored indoors.

Tools & Consumables Needed

1. Must Have Tools
- Aluminum straight edge 24" minimum
- Heavy-duty knife & replacement blades
- Chalk line & refill bottle
- Measuring tape - Imperial measurement units (Tiles are made to Imperial measurements)
- V-Notched trowel with 1/8" deep grooves - standard ceramic tile adhesive spreading trowel for perimeter tile to base adhesive spreading at installation edge
- Felt tip marker/paint tip marker to mark tiles for cutting
- Single barrel caulking gun for 28 oz tubes to dispense adhesive



2. Optional Tools
- Knee pads
- Jig saw preferably with rubber cutting blade (no teeth)
- Bandsaw for intricate and/or volume cutting

3. Consumables
- Gloves
- Duct or masking tape to protect adjacent items during adhesive application
- Mineral spirits for clean up purposes

Site Survey

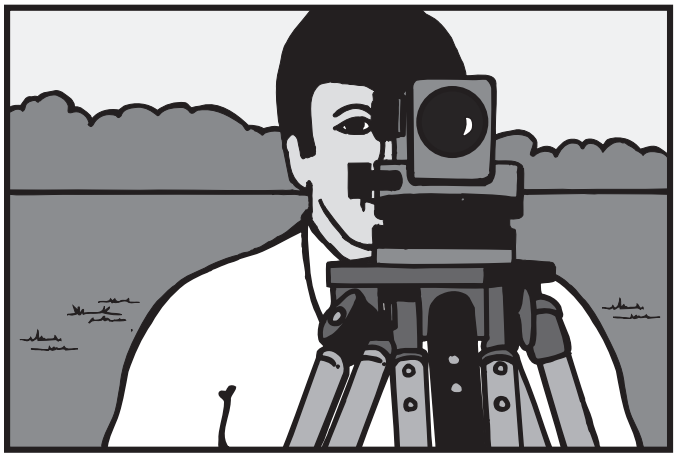
1. Sub-Surface Drainage
For both interior and exterior SofTILE® installations it is important that the sub-surface drains properly due to the porous nature of SofTILE®.

a) Naturally Draining Sub-Surface
If the installation site is elevated with natural drainage, and does not currently collect water, then additional storm water management may not be necessary.

b) Non Draining Sub-Surface
If the installation area is lower than the adjacent grades and tends to collect water, or if water puddles on the sub-surface, then a sub-surface water management system must be installed.

c) Solid Sub-Surfaces
If the sub-surface is solid (i.e. concrete or asphalt) and water collects on the surface deeper than 1/4" (.125") in any area where the tiles are to be adhered to the base, these areas must be filled with patch materials recommended by the concrete or asphalt supplier. (See surface preparation section).

d) Slope
It is important that the sub surface be sloped a minimum of 2% toward the water collection drains.



2. Orientation

Note: Although the final orientation of the installed surface may not be a matter of choice, some consideration should be given to the following items.

a) Direct Sunlight
SofTILE® is made from recycled rubber. Rubber absorbs heat from exposure to direct sunlight, rather than from exposure to atmospheric temperature. If the surface area is exposed to continual direct sunlight, design considerations should include lighter colors that reflect infrared light. (Lighter colored surface will provide a modest impact on surface temperatures).

b) Continual Shade or Damp Areas
Installation sites with continual shade may remain damp for long periods of time. During warmer temperatures damp areas may be subject to mold growth. In light of this, tile surfaces in shaded areas with the potential for mold growth should be cleaned periodically.

Site Preparation - Pre Sub-Surface

NOTE: This manual is not intended as an extensive guideline for installation of aggregate sub-surfaces. If your project requires installation over a compacted aggregated sub-surface, please refer to SofSURFACES compacted aggregate installation guide before proceeding to the next step.

Note: Base preparation is normally covered under a separate contract from the SofTILE® installation however, the following information is provided as a brief guideline for those installations that do not have a properly prepared base.

1. Remove all Sod and Topsoil
Remove topsoil until solid, packed and stable sub-soil is visible and level.

2. Install Water Collection System
Carefully survey the site for drainage. Inspect the area after a rainstorm or test with local water supply. If this test results in the necessity to install a drainage collection system, then complete the following steps:
a) Excavate trenches to contain perforated PVC pipe. Top of PVC pipe should be level with bottom of intended granular base. (PVC pipe is preferred over corrugated plastic drain tile because of the tendency for plastic drain tile to become crushed during it's life cycle).

b) Install perforated PVC pipe with correct slope. Connect ends.
c) Wrap perforated pipe with landscaping fabric.
d) Back fill trenches with 3/4" clear stone. This 3/4" stone should wrap the drainage pipe to a diameter of approximately 12".
e) Tie drainage system into existing storm sewer or ditch. Restore finished surfaces over trenched areas with appropriate ground cover (sod, etc.).

Note: A properly designed and installed water collection system is often overlooked during SofTILE® site planning stages because in many cases the planner fails to give consideration to the porous nature of the finished SofTILE® surface. Since water readily passes through the corners of the SofTILE system, it is critical that a proper sub-surface drainage system be installed. Failure to do so could result in damage to the sub-surface and or SofTILE surface.

Site Preparation - Sub-Surface

For Packed Aggregate Sub-Surfaces see the Guideline Provided by SofSURFACES Entitled: Packed Aggregate Substrate - Installation Procedures.

1. Test Sub-Surface for Proper Slope
During heavy rains, water will collect on surfaces with slopes that are less than 2% or if the grade of the surface is not consistent. The surface should be able to accommodate 25 year storm water volume.
If water collects on any non-porous subsurface (asphalt or concrete), the adhesives can be affected over time.
If significant water volumes cannot escape from the sub-surface and water backs up under the tiles, the hydraulic pressure could also result in a damaged installation.
To test the grade and drainage, flood the area with water and mark puddles with chalk. Puddles deeper than 1/4" and larger than 1" in diameter should be patched.

2. Test Sub-Surface for Proper Grade
Frequently, sub-surface preparation is completed under separate contract to the SofTILE® installation. When the subsurface is completed under another contract it may not be smooth enough for an immediate SofTILE® installation because:
a) Aggregate sub-surfaces often become disturbed in the time between sub-surface installation and SofTILE installation.
b) The sub-surface contractor may not have taken the care and necessary steps to achieve a smooth surface.

Note: Any undulations in the sub-surface will be visually apparent in the finished SofTILE surface.

3. Repair all variations in grade that are greater than +/- 1/4" over 10' (in any direction)

a) Add "chip & dust" or "granite screenings" (actual names vary regionally) to the depressed areas of packed aggregate sub-surfaces.

b) Patch solid sub-surfaces with materials recommended by the concrete or asphalt manufacturer.

4. Inspect Concrete Finish to Ensure There Are No Cracks and/or Loose Material

Concrete should have a light broom finish for best surface adhesion. A heavy broom finish will result in a higher than normal adhesive usage. Ensure that there are no significant cracks and that the area is level.

Note: A properly prepared asphalt or concrete sub-surface is the ideal sub-surface for SofTILE®.

5. Preparing Concrete Surfaces for Proper Adhesion

a) Confirm that the Concrete or Asphalt has Fully Aged/Cured

Since the perimeter tiles must be adhered to the concrete or asphalt sub-surface, it is important to ensure that it has cured sufficiently. Normally this is a minimum of 28 days for either asphalt or concrete. Allowing the concrete to sufficiently cure will ensures that most of the moisture has left the sub-surface. Less then 3lbs moisture per 1000 square feet is the ideal dryness level before applying adhesive.

b) Make sure Concrete and Asphalt Surfaces are Dry

It is important that the surface be completely dry to avoid adhesive failure.

c) Acid Etch to Enhance Cleaning (optional)

Note: Etching the concrete increases the adhesion by opening the surface pores of the concrete. Etching may be required on older surfaces with fuel, oil or other contamination.

Mix 25% Muriatic acid by volume to water (1 part Muriatic Acid to 3 parts water). Wash the entire area with this solution. A light broom scrub will be sufficient. After the complete area has been etched, carefully rinse the entire surface and allow adequate time for the concrete to completely dry.

d) Power Wash Older Sub-Surfaces

Power washing is recommended on older concrete to properly clean the area. This is especially important if the concrete has been contaminated with fuel, chemicals dirt etc.

Prior to Installation

1. Confirm Adequate Materials to Complete the Installation

It is important to have enough products to complete the entire installation in a single installation session for the following reasons:

a) SofTILE® Plus and SofTILE® Premium, like new wood, concrete, asphalt or painted surfaces will change color with exposure to UV. This change is not as noticeable when all of the installed tiles change color at the same time. However, like installing a new piece of wood beside an old one, there will be a noticeable difference in the color tone of tiles installed at separate times.

b) Installing all tiles in one session ensures similarity in installation conditions and efficiency.

2. Atmospheric Temperature Above 40°F

Atmospheric temperatures should be above 40°F for at least 24 hours and preferably climbing. Viscosity, work life and final cure time of the adhesive will vary dramatically with temperature. Tile installation is not recommended if/when temperatures are expected to remain below 40°F for an extended period of time

3. Watch for Variance in Color Tones

SofTILE® Plus may have a slight variance in color tone from tile to tile. This is due to the recycled nature of the raw materials used in the production of rubber safety tiles.

Visual effects of color variation can be minimized by placing these tiles in a less visible area such as under play decks.

Confirm Site Size and Layout

1. Multi-Colored Surface

Note: A shop drawing of the installation should accompany multiple colored SofTILE® installations with surface patterns. Confirm the shop drawing is accurate to actual site measurements and customers expectations prior to commencing installation.

2. Take Proper Measurements Prior to Commencing with Installation

Since SofTILE dimensions can vary by +/- 1/8 inch it is very important to connect a row of tiles and take the exact measurement of the entire row prior to beginning installation. The theoretical length of 15 tiles should be 30 feet however the actual length may be slightly shorter.

Note: Laying out tiles well in advance of the installation to ensure that each tile has an equal surface temperature will help to reduce tile size variance.

**In Figures 1 through 4 we have used a site dimension of 30' by 30'. We used a sample dimension of 29'11" for the row of connected tiles.*

Note: To ensure a visually proportionate site, lay the surface out with equal dimension cuts on all four sides of the site. In most instances, when ramp edging is not used, plan on beginning and ending with cut tiles of roughly equal dimensions. For visual purposes cut tiles should be a minimum of 10 inches.

a) Measure and mark the center point on both the length and width of the site *(Fig 1 - Overhead View).*

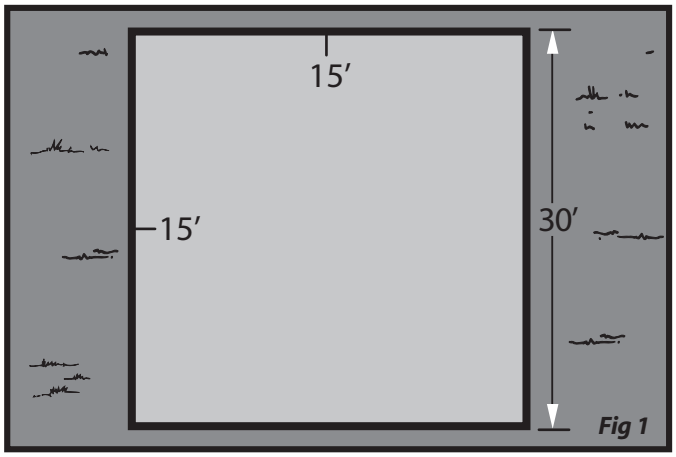


Fig 1

b) Lock together a row of tiles equal to the length and width of the site and measure the dimension *(Fig 2)*.

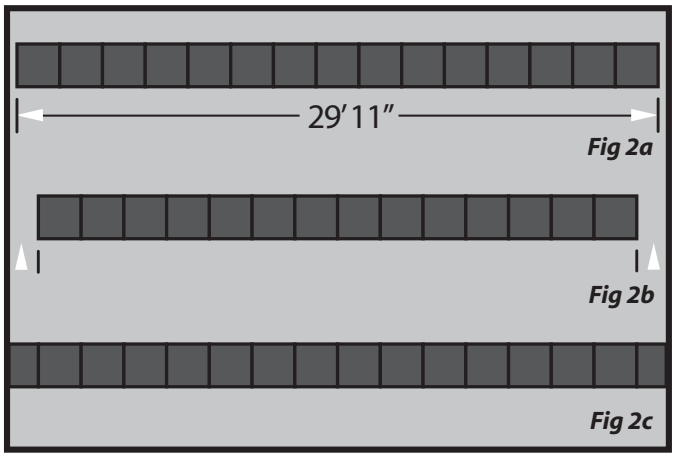


Fig 2a

Fig 2b

Fig 2c

c) Using both the measurement from the halfway point to the perimeter and the measurement of the row of tiles you will be able to determine the size of the perimeter cuts. In our example the halfway point is 15′ and the measurement of the row of tiles at the halfway point measures 14′ 11 ½ inches. Installing the full row of 15 tiles without calculating the cuts would leave us with a 1/2″ gap on each side of our site *(Fig 2a)*. To avoid this we will be centering 14 tiles which will leave us with a 1′1/2″ gap on each side of the site *(Fig 2b)*. By increasing the perimeter cuts from ½″ to 1′½″ we create a more visually attractive installation *(Fig 2c)*.

Note: During the quoting and material calculation process variance in tile dimension will have been taken into consideration when calculating tile quantities.

Once the size of the outside perimeter cuts have been determined we are ready to string our lines which will be the basis for the beginning of the installation.

d) String a line parallel to the retainer. The distance between the retainer and the first string line should be equal to the size of the perimeter cuts. Based on our example this measurement is 1′1/2″.

e) String a second line along the adjacent retainer forming an "L" shaped string line *(Fig 3)*.

Note: For ease of installation install the field of tiles first leaving the outside perimeter cuts until last.

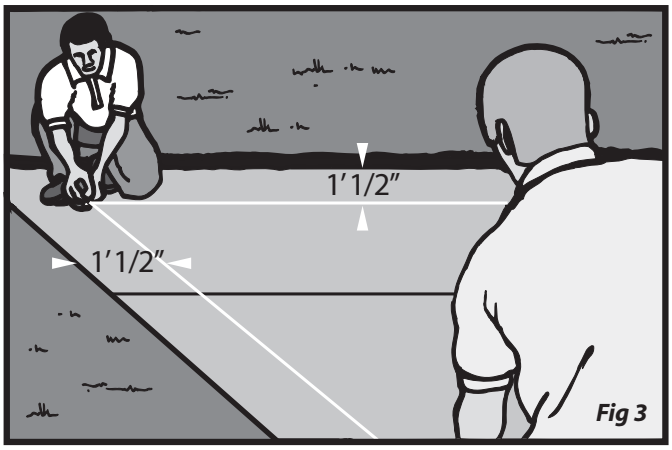


Fig 3

3. Checking for Square

Note: Prior to beginning installation it is important to ensure that the string line is square. Ensuring that the string line is square will provide a smooth and neat installation. In order to check for square we will be using what is often referred to as the "three-four-five" method.

a) Measure three feet down one side of the string line and make a mark *(Fig 4a - Overhead View)*.

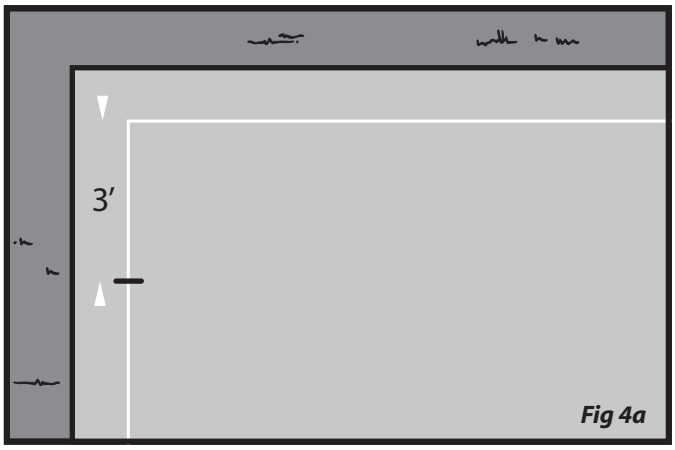


Fig 4a

b) Measure four feet down the perpendicular string line and make a mark *(Fig 4b)*.

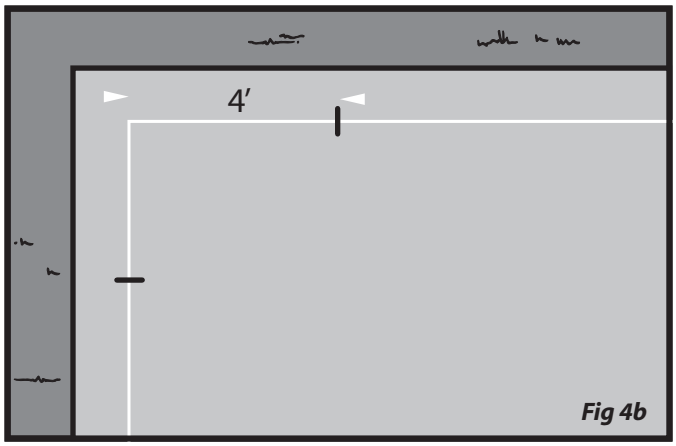


Fig 4b

c) Measure the distance of the 45 degree angle between the two marks. If the lines are square the measurement of the 45 degree angle will be 5 feet *(Fig 4c)*.

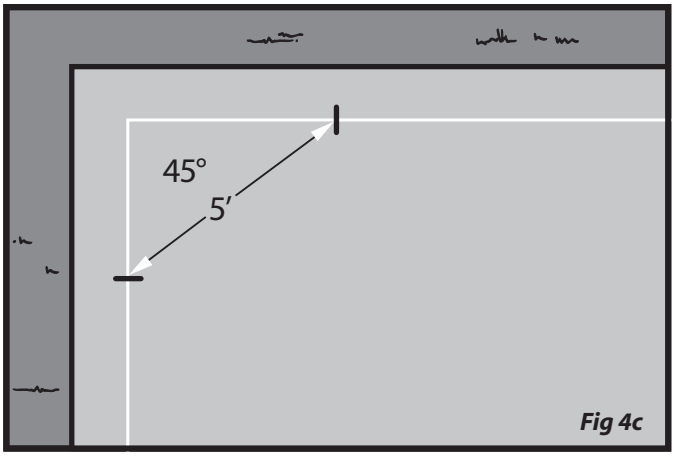


Fig 4c

d) If the measurement of the angle is more or less than 5 feet, your lines are not in square and you will need to move one or both of the lines in or out until you reach the 5 foot measurement *(Fig 4 d)*.

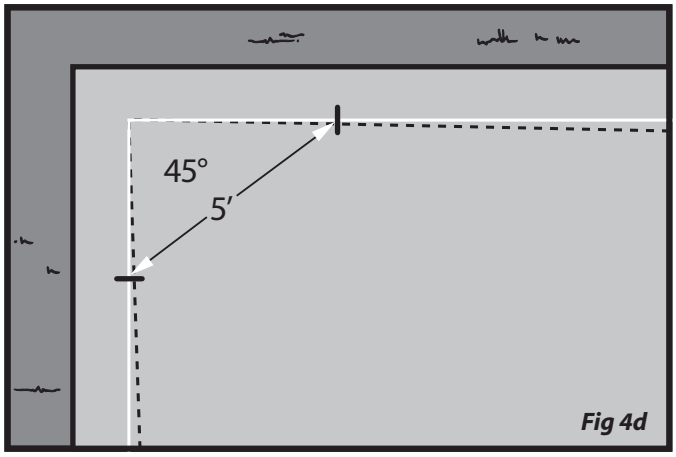


Fig 4d

Note: These instructions assume the adjacent walls and support structures are square. In the event non-square walls result in very thin cutting-strips at the edge of the layout, move entire layout in a direction that allows cut pieces to be a minimum (cosmetically) acceptable size. The minimum acceptable size is approximately 10 inches. Installing tiles on a site that is grossly out of square is beyond the scope of this installation guide. If you discover that your site is grossly out of square, consult an installation professional or refer to our more detailed installation video.

Installing Tiles

Install First Row in L-Shape Pattern

a) Install the first row of tiles along the string line. The edge of the top bevel of the tile should align with the string line *(Fig 5 a)*.


Fig 5a

As the tiles are being installed each tile will need to be fitted as tightly as possible to the adjacent tile. This is normally done by using a rubber mallet or the heal of your foot to "kick" the tiles tight.

Note: If physical force does not position the tile properly, rotating the tile into alternate positions will in most cases ensure a proper fit.

b) Install the second row of tiles along the second string line forming an "L" shaped installation *(Fig 5b)*.

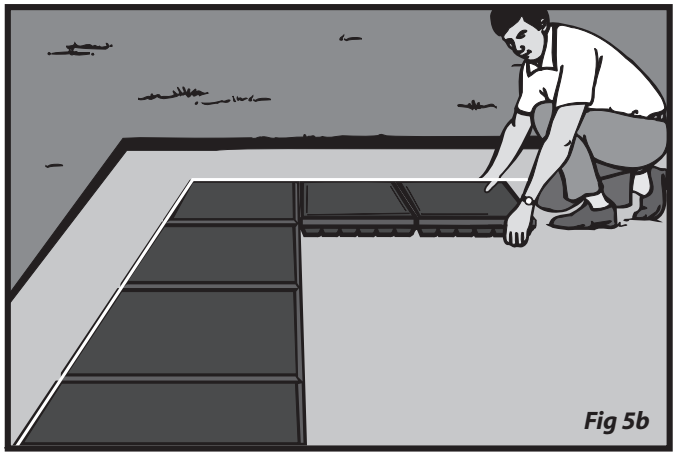


Fig 5b

Continue to install tiles inside the L-shape. Be sure to use the "kicking" technique on each row installed, forcing each row against itself as well as against the adjacent row of tiles *(Fig 5 c)*.

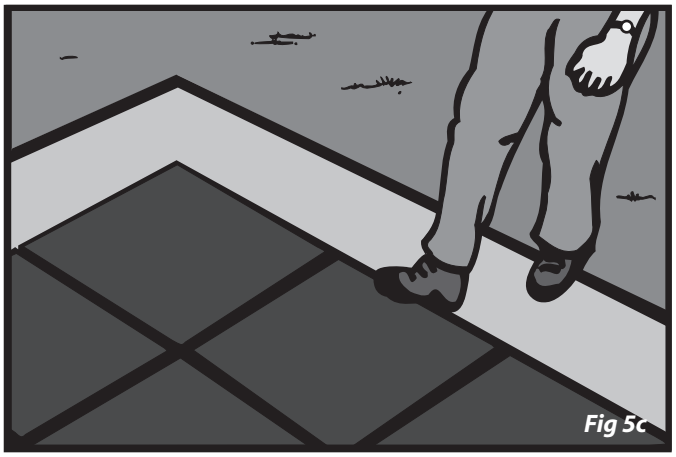


Fig 5c

Note: Attention must be given to the amount of force used to align the tiles. Too much force will put the installation out of alignment.

Adhering Tiles

1. Adhesive Facts

- *Surface temperatures above 5 degrees are recommended.*
- *Surfaces must be completely dry, free of moisture, and clean.*
- *Adhesive comes ready to use. Do not open cartridges until preparatory work has been completed. Cut nozzle to 1/2" diameter.*
- *Adhesive is workable up to 30 minutes.*
- *An 825 ml cartridge bonds 20 tiles using a 1/2" bead of adhesive.*
- *A 1/2" bead cures in approximately 16-24 hours at 25 degrees Celsius (78 degrees Fahrenheit) and 50% relative humidity.*

2. Application Methods

Adhesive is applied in several manners depending on the type of installation and substrate.

a) Outdoor Installation with Aggregate Substrate

- 100% continuous 1/2" diameter bead of adhesive placed on the vertical wall of the U-shaped interlocking joint starting at the bevel *(Fig 6a)*.

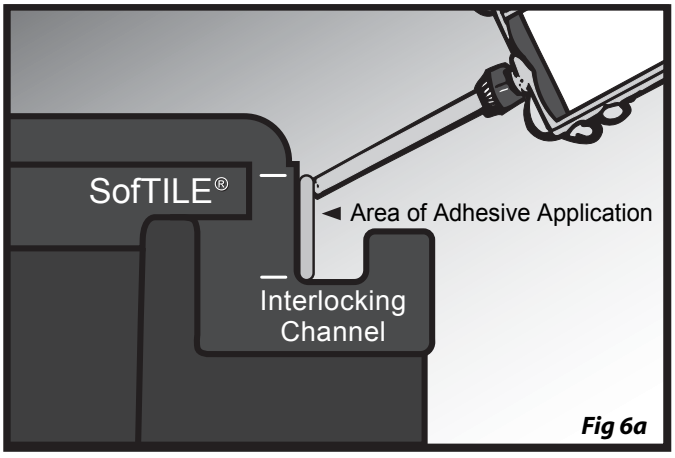


Fig 6a

- 100% adhesive spread over the portion of the adjacent retaining wall *(Fig 6b),* that will be in contact with the tile edge *(Fig 6c)*.

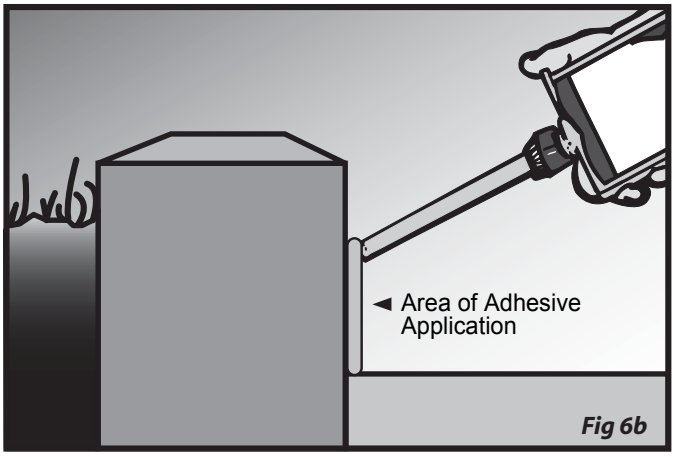


Fig 6b

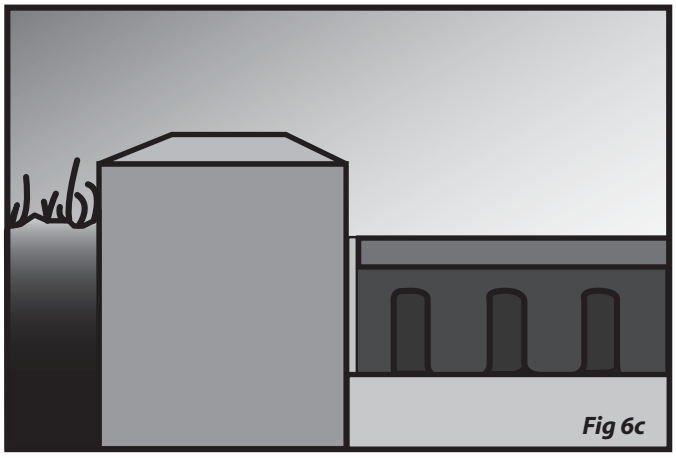


Fig 6c

b) Outdoor Installation with Concrete or Asphalt Substrate

- 100% continuous 1/2" diameter bead of adhesive placed on the vertical wall of the U-shaped interlocking joint starting at the bevel *(Fig 6a)*.
- 100% adhesive spread over 12 inches of the perimeter of the surface. Perimeter tile adhesion is done by either turning the tile over, and applying a 1/2" diameter bead of adhesive around each circular stanchion on the first half of each perimeter tile or by applying the adhesive to the first 12" of the perimeter sub-surface using a 3/8" notched trowel *(Fig 6d)*.

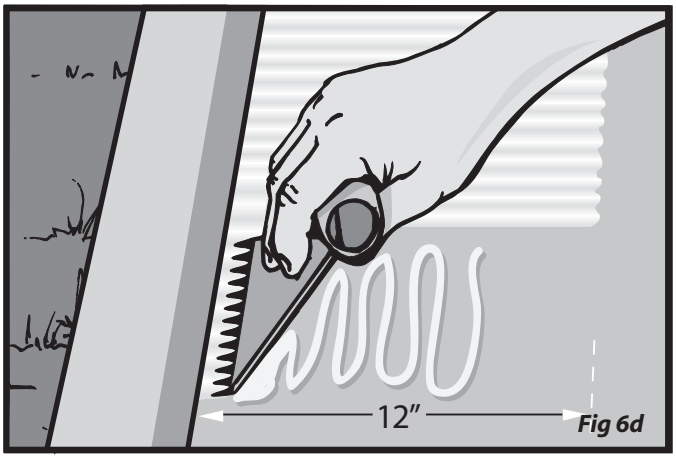


Fig 6d

- 100% adhesive spread over the portion of the retaining wall that will be in contact with the tile edge *(Fig 6b)*.
- If ramps are used 100% spread of adhesive over the bottom of the ramp or substrate where the ramp will be placed.

c) Indoor Secure Installation

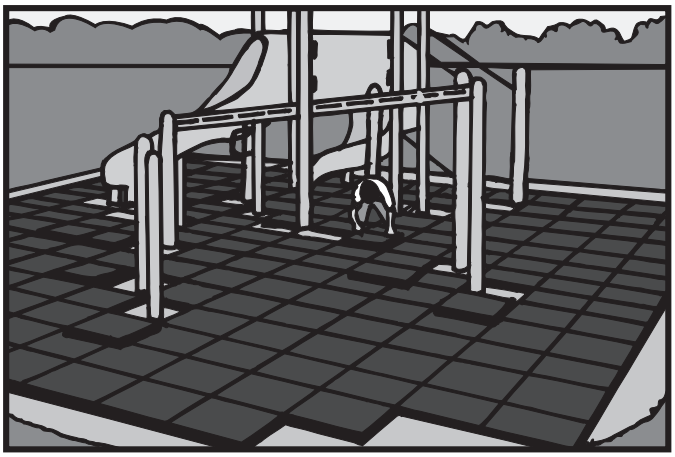
On indoor secure installations the use of adhesive is optional to allow for periodic removal and cleaning.

Notes:

- ***The application of adhesive to the KrosLOCK joint is critical to overall performance of your new safety surface.***
- ***Only use adhesive provided by or recommended by the manufacturer.***
- ***Protective gloves should be worn to prevent skin contact.***
- ***Take caution to ensure that adhesive is not spilled on adjacent surfaces.***
- ***Uncured adhesive spills can be removed with a rag and mineral spirits***

Marking and Cutting Tiles

Note: For ease of installation, leave all cuts until last.



Perimeter Marking

Mark any cuts for the perimeter tile pieces in the following manner:

1. With a tape measure, begin on the edge of the perimeter void where the tile needs to be placed and take a measurement from the edge of the perimeter to the edge of the last placed full tile. Transfer this measurement onto the tile that has been selected to be cut *(Fig 7a - Overhead View)*.

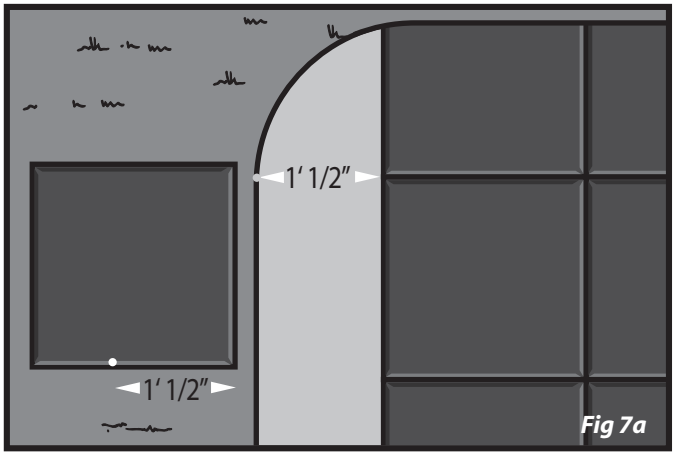


Fig 7a

2. Move the tape measure approximately 3 inches across the void where the tile will be placed and take a second measurement. Move the same distance across your tile to be cut and transfer the second measurement onto the tile *(Fig 7b)*.

Note: Continue this process until enough references points have been transferred onto the tile. Straight regular cuts may only require two measurements per tile however irregular perimeters such as circles will require measurements in 3 inch increments across the tile *(Fig 7c)***.**

Fig 7b

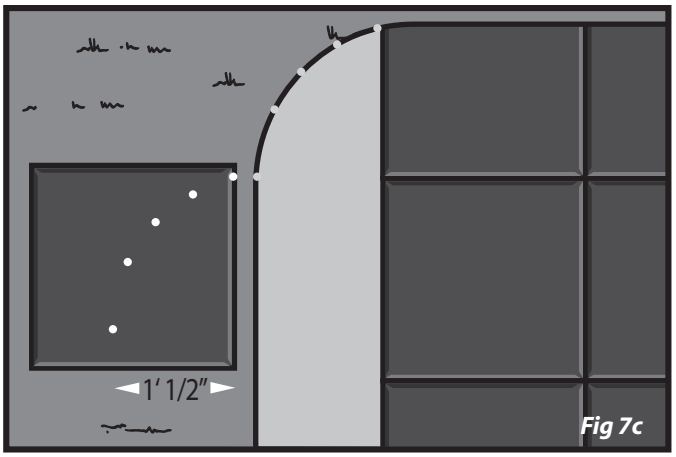


Fig 7c

3. After the measurements have been transferred onto the tile to be cut, connect the markings using a flexible aluminum straight edge and felt tip marker *(Fig 7d)*.

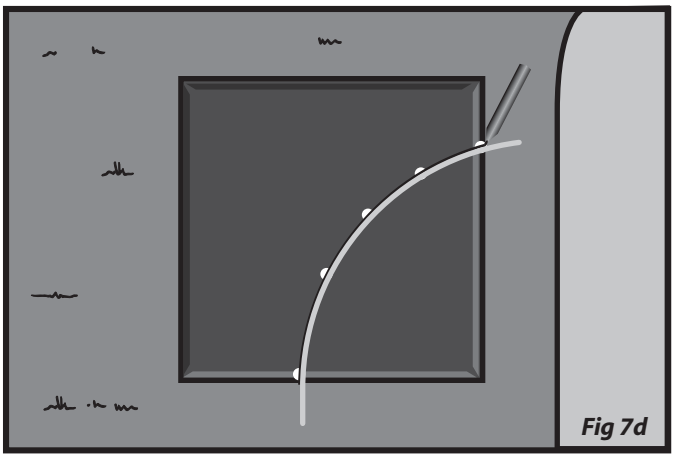


Fig 7d

4. Continue measuring and marking all perimeter tile pieces.

Note: In the event that a full tile is placed against a retainer, it will be necessary to remove the "female" lock to allow the tile to fit flush. Once the lock is removed it is recommended that the cut piece is placed under the "male" lock to provide additional support.

Marking Posts

Note: The diameter of playground equipment posts vary across the industry. If you are unsure of the diameter of your equipment post you can calculate it by measuring the circumference of the post and multiplying by .31831.

1. Determine the diameter of your posts and make a template out of a hard material such as cardboard or plywood. A five inch diameter post would require a 5 inch circle for a template.

2. For easy visual reference place the tile to be cut near to and in a similar orientation to it's final placement position *(Fig 8a)*.

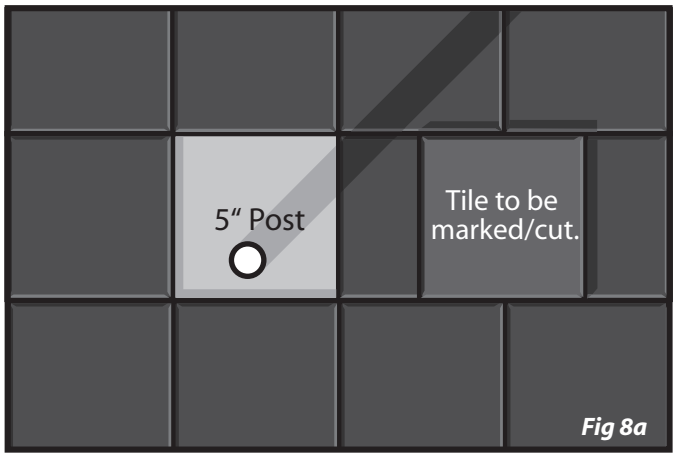


Fig 8a

3. Measure the distance of the void between the edge of the post and the edge of the adjacent placed tile *(Fig 8b)*.

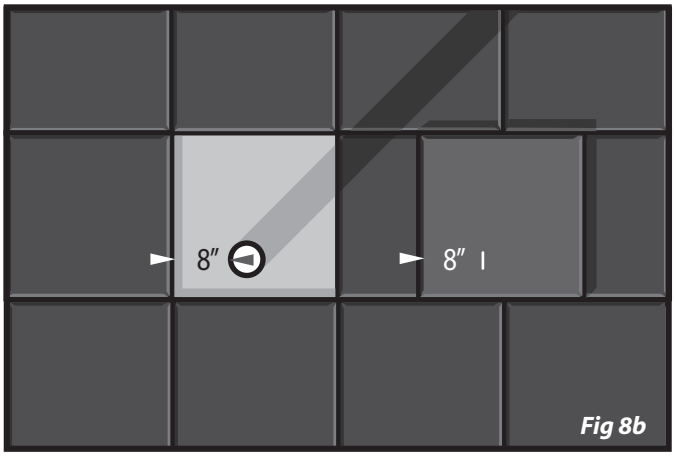


Fig 8b

4. Transfer this measurement onto the tile to be cut by marking the tile. The marking should be in the form of a line approximately 3 inches long *(Fig 8b)*.

5. Once the first mark has been made a second mark can be placed based on the diameter of the post. Assuming a 5 inch diameter post, measure 5 inches across from the first post and place your second marking. You now have the first two reference points for the cut *(Fig 8c)*.

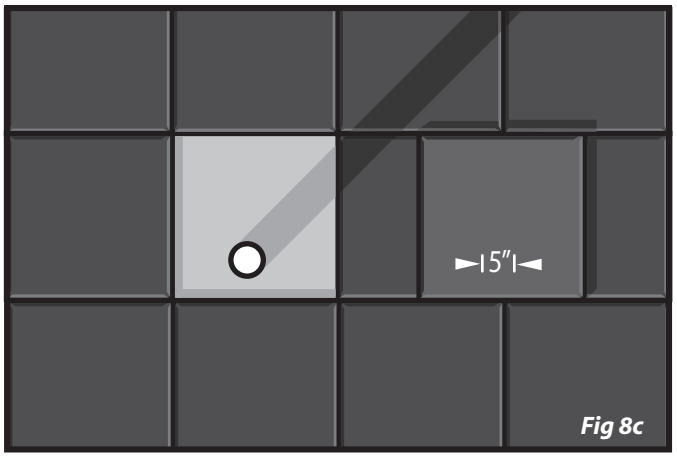


Fig 8c

6. Move the tile to be cut into the second position that will allow a good visual when measuring. If the horizontal measurement has been taken then move the tile into a vertical position *(Fig 8d)*.

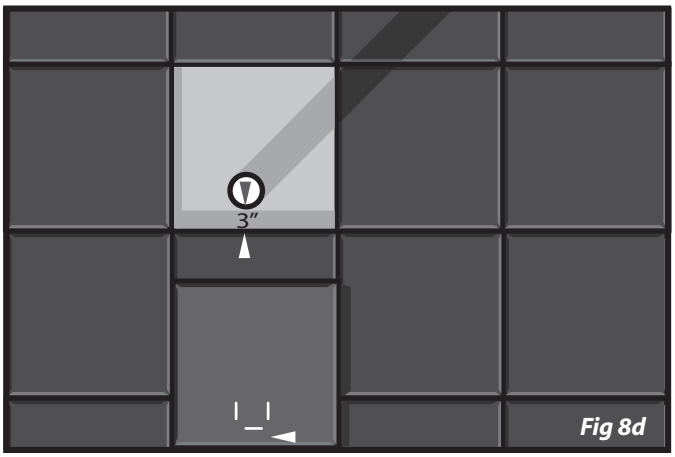


Fig 8d

7. Using the same method as *Fig 8c*, measure the distance from the edge of the post to the adjacent placed tile. Transfer this marking onto the tile to be cut (*Fig 8d)*.

8. Assuming a 5 inch post measure from your mark 5 inches across and place your final mark (*Fig 8e)*.

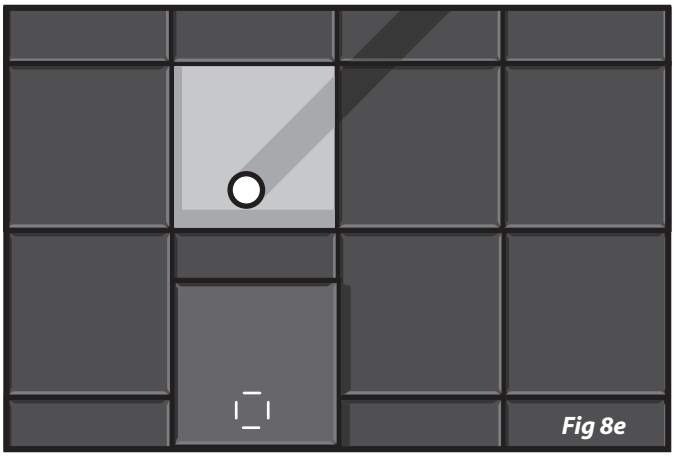
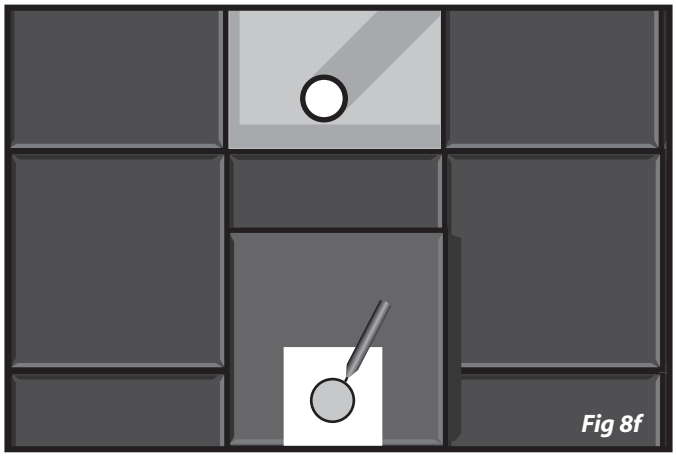


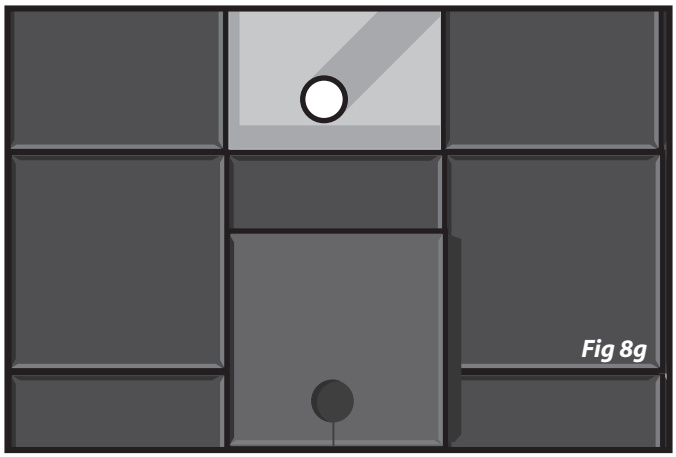
Fig 8e

9. You now have four markings that resemble the outline of a square.

10. Place your template into the center of the "square" and mark the perimeter of the template. You are now ready to make your cut *(Fig 8f)*.



Note: You will need to cut into the side of the tile before you make your circular post cut. When doing so always cut the side of the tile that represents the shortest distance from the tile edge to the cut (Fig 8g).



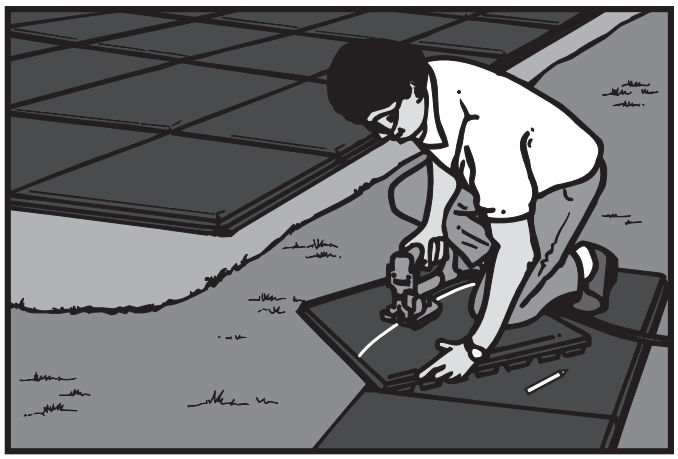
Cutting Tiles

Cut tiles using a sharp, Olfa (or equivalent) cutting knife. Place tile on a flat, level and hard surface. Score the area to be cut first. Once a score has been made apply pressure to the tile to open the score. Opening the score of the tile reduces friction between the tile and the knife making the cut much easier. Continue making passes with the knife working your way through the tile.

a) Cut on Inside of Mark

Since rubber is flexible and has the ability to compress it is always better to make your post hole cut a fraction smaller than required. This will allow for a very tight fit.

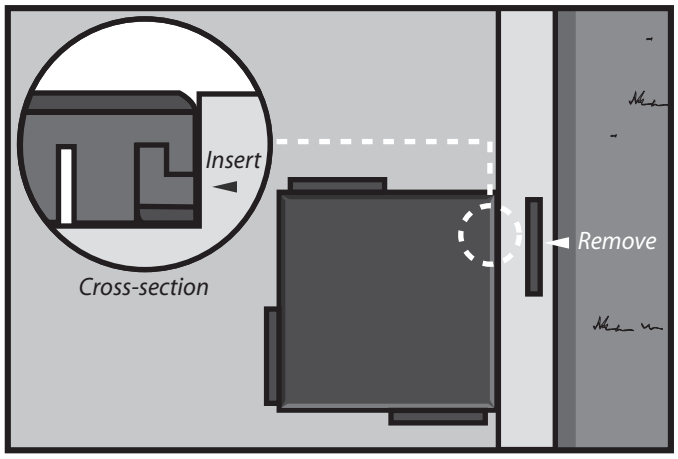
A simple reminder, that it's easier to do 2 cuts than trying to "stretch" a short piece!



b) Volume Cutting

SofTILE® is easily cut with a heavy-duty knife. However, on jobs that have a large quantity of multiple and/or similar cutting, you may consider bringing a bandsaw to the site. The bandsaw should have a rolling table and a toothless blade to prevent blade friction and allow for straight cuts.

Note: In the event that a full tile is placed against a retainer, it will be necessary to remove the "female" lock to allow the tile to fit flush. Once the lock is removed it is recommended that the cut piece is placed under the "male" lock to provide additional support (Fig below).



Overhead View

Final Installation Details

1. Remove any Adhesive Spills

a) "Smeared" Adhesive Spill

If a small amount of adhesive is spilled onto the surface during installation, this can be removed immediately by wiping the spot with a rag containing a small amount of mineral spirits. Use proper handling procedures.

b) "Bead-Shaped" Adhesive Spill

If any adhesive inadvertently drips out of the end of the caulking tube onto the SofTILE® surface, and this adhesive lies on the tile

in a convex shaped bead, it should be removed only after it has partially cured. Use a knife to "scrape" the bead off of the tile.

2. Initial Appearance and Maintenance
Solid SofTILE® colors will behave like new carpets when initially installed. The solid, brilliant colors will make the initial dust created by foot traffic very apparent. However, with time, the visible dust tracking will diminish.

3. Initial Odor
The polyurethane used to bind the rubber granuals is 100% inert and odorless after it has fully cured. Full curing can take up to several days depending on atmospheric temperature and moisture. The odor may take longer to dissipate on indoor applications because of the confined area.

4. Sealant
It is SofSURFACES recommendation not to apply sealants to any SofTILE® surface.

Routine Maintenance

1. Routine Maintenance Extends Life and Enhances Appearance
Like any surface, a good routine maintenance program will enhance the longevity and appearance of the SofTILE® surface.

2. Sweeping
Sweeping the surface with a broom will be the most common method of keeping the SofTILE® surface clean. However, because of the porosity and granular texture of the surface, it is difficult to remove all contaminants by sweeping alone.

3. Vacuum
Periodic vacuuming is recommended in areas where sand is frequently tracked onto the surface.

4. Water Hose
Use a water hose with a pressure spray tip to remove contaminants from porous top surface. This is easier than using a broom. However, interior installations may place restrictions on water usage.

5. Cleaning Agents
SofTILE® can accommodate moderate use of most household or commercial cleaners that contain both odor suppressants and disinfectants. Dilute this cleaning agent as recommended by the manufacturer. Apply to the surface using a mop or scrubbing device. This will remove most light stains.

Advanced Maintenance

Depending on frequency of use, SofTILE® will occasionally need a "deep clean" to remove built up dirt and stains.

1. Steam Vacuum
A steam vacuum with or without cleaning agents is ideal for advanced cleaning and maintenance. Follow instructions.

2. Power Washing
In areas that can accommodate power washing, use a power washer with a wand tip.

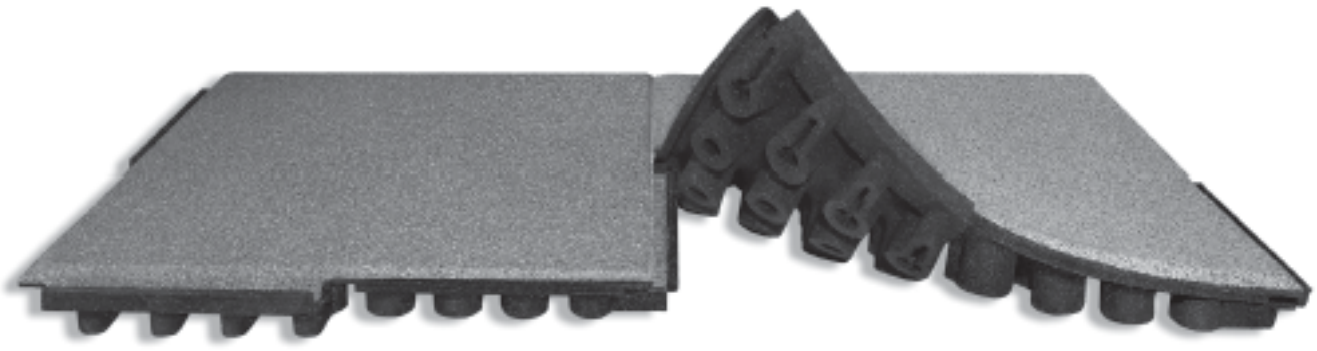
Thank You

The entire SofSURFACES team wishes to thank you for your careful consideration and decision to purchase a SofTILE® safety surfacing system. Your investment in a SofTILE® system is a wise one. The locking feature found in our KrosLOCK design will not only make your installation simpler but it will enhance the appearance, strength and durability of your safety surface for years to come.

It is important to note that proper installation is a critical component to the overall success of your surface This manual has been prepared with the long-term performance of your surface in mind. By carefully following the procedures set forth in this manual, you can be assured of a quality installation.

We work hard to produce the highest quality products and our dedication to customer service does not end with the sale of our surfaces. As industry leaders we are committed to the long-term success of your project. We are available by phone at 1-800-263-2363 from 7:00 am to 5:30 pm, Monday through Friday, EST.

Thank you for your confidence, it is a pleasure to know that our efforts have made your playground safer.



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