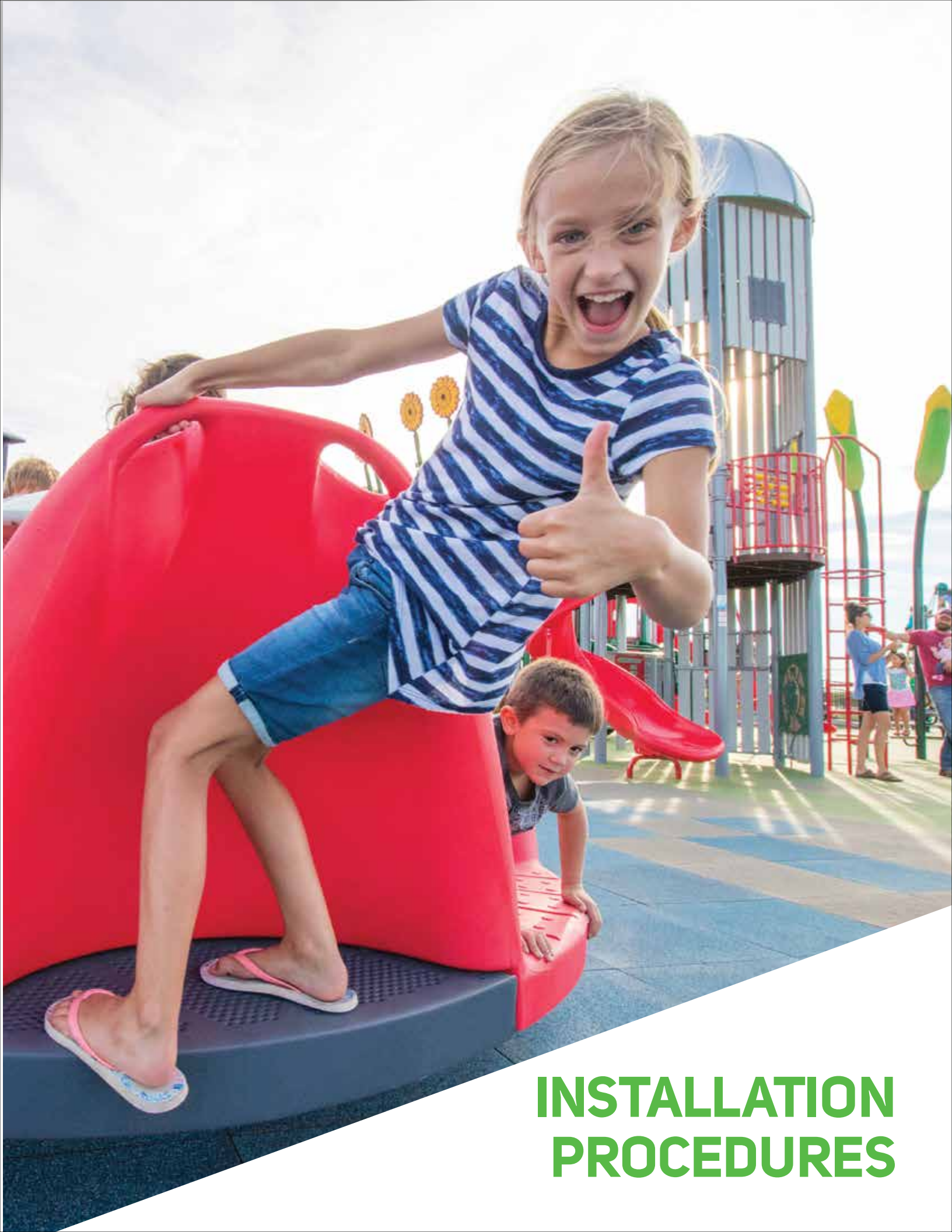


INSTALLATION PROCEDURES

INSTALLATION GUIDE

INTRODUCTION

The PlaySafe™ playground surfacing system has been designed to be installed using specific installation methods developed to ensure the long-term performance of the surface. Each step in the installation process is critical to ensure a successful installation. This manual has been designed utilizing the best installation techniques taken from various professional PlaySafe installation crews across North America. The manual was designed to ensure that the PlaySafe surface has been installed according to specification and has also incorporated the most efficient methods of installation.

PRODUCT STORAGE

1. Adhesive

Store all manufacturer-supplied adhesives in a dry storage area. Shelf life 12 months.

2. duraSAFE

Tiles that will be stored for a long period of time prior to installation should be stored indoors. See further notes for storage during installation.

TOOLS & CONSUMABLES

Like any job, your duraSAFE installation will go much smoother with the proper tools. The following list of tools and consumables are recommended for your upcoming project:

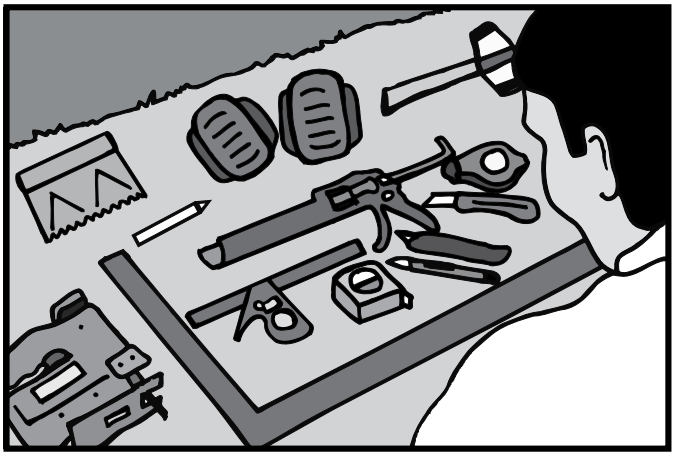
- Broom
- Leaf blower
- Aluminum straightedge 30" minimum – black lettering
- 24" square and speed square – yellow or white lettering
- Measuring tape – Imperial measurement units (Tiles are made to Imperial measurements)
- Felt-tip marker/paint marker to mark tiles for cutting (Sharpie™ – metallic silver or equal)
- Chalk line & refill bottle (black is permanent)
- String line
- Heavy-duty auto-lock cutter utility knife (Olfa LA-X™ or equal) & replacement blades (LBB UltraMax™ or equal)
- Jigsaw (Bosch or equal – minimum 5.5 amp or greater recommended)
- Jigsaw blades; 10 teeth per inch minimum – Should be 1/4" shorter than the thickness of tile (in saw and when extended)
- Templates – for marking postholes for cutting
- Polyurethane expansion foam
- Duct or masking tape to protect adjacent items during adhesive application
- Disposable rags and/or paper towels (adhesive clean up)
- Goof Off® (red can), made by Valspar
- 18V Cordless adhesive dispensing gun for 20 oz (by volume) tubes – including lithium 1.5 amp hour battery and charger, end cap for orange cone, orange cone nozzle, welded end cap for custom nozzle, custom slotted nozzle, Hytrel plastic piston
- Manual adhesive dispensing gun for 20 oz (by volume) tubes – including end cap for orange cone, orange cone nozzle, welded end cap for custom nozzle, custom slotted nozzle, Hytrel plastic piston
- V-Notched trowel with 1/8" square notch or 3/16" v-notch – plastic or metal trowel – for tile to base adhesive spreading
- 8 lb sledgehammer
- Pipe Fittings (3/8"), for glue gun

Personal protective equipment

- Disposable protective gloves (latex, nitrile or other) – for adhesive application
- Gloves (general work gloves)
- Safety glasses
- Hard hat
- Knee pads

Optional equipment

- Vacuum cleaner
- Hot box – for heating of adhesive
- Flex curve carpenter



SITE SURVEY

1. Orientation

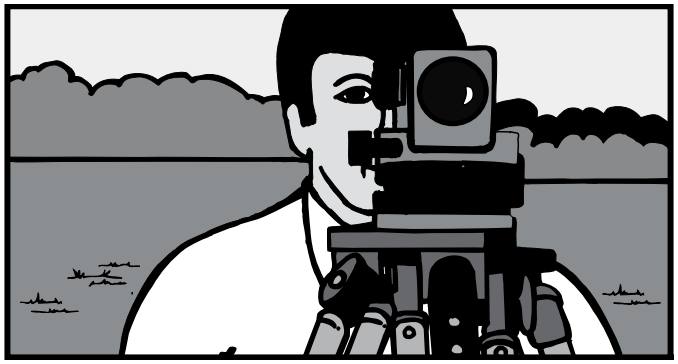
Note: Although the final orientation of the installed surface may not be a matter of choice, some consideration should be given to the following items.

a) Direct sunlight

PlaySafe 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.)*

Sun exposure is one of the potential safety threats on playgrounds. Any child, youth or adult can suffer from harmful UV rays penetrating their skin, or they can be burned by play equipment or rubber surfacing that has become too hot from sitting in direct sunlight. To avoid these risks, trees and other shading devices can be planned into the design of a playground area for sun protection.

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.



2. Subsurface drainage
For both interior and exterior PlaySafe installations it is important that the subsurface drains properly. Contact a local expert for your specific criteria.

a) Naturally draining subsurface
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 subsurface
If the installation area is lower than the adjacent grades and tends to collect water, or if water puddles on the subsurface, then a sub-surface water management system must be installed.

c) Solid subsurfaces

If the subsurface is solid (i.e. concrete or asphalt) and water collects on the surface deeper than 1/4" 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

The subsurface must be sloped 1% towards the water collection drains.

e) Solid retainer

All installations that are bordered with a solid retainer must be designed with a drainage system to prevent pooling of water.

Note: Insufficient drainage will result in the PlaySafe surface being subjected to standing water for long periods of time. Standing water will damage the PlaySafe surface and void the limited lifetime warranty.

SITE PREPARATION

The ideal subsurface for the PlaySafe KROSLOCK system is properly prepared concrete or asphalt that is cured, clean, dry and free of oils and moisture.

- IncStores® recommends properly cured and installed concrete.
- The second preferred alternative is properly aged and prepared asphalt. To ensure proper adhesion, the oils in the surface must be removed using a walk behind concrete grinder *(see **adhesive section** for details)*.
- PlaySafe can also be installed over a properly leveled and compacted subbase of 4" of 3/4" minus aggregate, followed by a minimum 1" layer of 1/4" minus screenings and followed with an EPDM membrane.

NOTE: CONSIDERABLE CARE AND SKILL IS REQUIRED TO PROPERLY INSTALL A GRANULAR SUBSURFACE.

Proper preparation of the subsurface is critical to the long-term success of your project. Due to the importance of proper subbase preparation, IncStores has created a separate instructional manual specifically addressing the correct subsurface preparation techniques required to obtain a surface suitable for a tile installation. Prior to beginning installation work please consult IncStores' subsurface preparation guide.

SITE PREPARATION – PRE SUBSURFACE

Note: Base preparation and proper drainage are normally covered under a separate contract from the PlaySafe installation. 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 subsoil is visible and level.

2. Install water collection system

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 its life cycle.)
b) Install perforated PVC pipe with correct slope. Connect ends.
c) Wrap perforated pipe with landscaping fabric.
d) Backfill 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 PlaySafe site planning stages. Although the tiles are impervious, water will pass through the corners and seams of the PlaySafe system. It is critical that a proper subsurface drainage system be installed. Failure to do so could result in damage to the subsurface and/or PlaySafe surface. See your Architect or Civil Engineer.

SITE PREPARATION – SUBSURFACE

Note: For packed aggregate subsurfaces see the guideline provided by IncStores entitled Subsurface Preparation Guide.

1. All subsurfaces require proper slope. The proper slope for a PlaySafe installation is 1%.
During heavy rains, water will collect on surfaces with slopes that are less than 1% 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 nonporous subsurface (asphalt or concrete), the adhesives can be affected over time. If significant water volumes cannot escape from the subsurface 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 ¼" and larger than 1" in diameter should be patched.

2. Test subsurface for proper grade.
Frequently, subsurface preparation is completed under separate contract to the PlaySafe installation. Check the surface to ensure:

a) Aggregate is properly compacted. May become disturbed in the time between subsurface installation and the PlaySafe installation. Check under equipment and along curbs.

b) The subsurface contractor may not have taken the care and necessary steps to achieve a smooth surface.

Note: Any undulation in the subsurface will become more visually apparent in the finished PlaySafe surface.

3. Repair all variations in grade that are greater than +/- ¼" over 10' (in any direction).

a) Patch solid subsurfaces with materials recommended by the concrete or asphalt manufacturer.

b) Aggregate subsurfaces must have a 1" layer of properly leveled and compacted ¼" minus screenings placed over top of a minimum 4" layer of properly leveled and compacted ¾" minus aggregate. EPDM membrane placed only when granular is correct.

4. Augering of sites will disturb the existing base surfacing.
Where concrete/asphalt or granular surfaces have been removed or disturbed, ensure that the areas are well compacted and sloped away from the posts. These areas should not be lower than the surrounding areas.

5. Curb heights are typically specified to be the height of the tile surface. Accuracy is critical.
An unlevel subsurface or curb is not cosmetically pleasing. Cutting the base of the tile to match the curb height will reduce the fall height rating and is not recommended.

6. 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, cured and dried concrete or asphalt subsurface is the ideal subsurface for PlaySafe.

Note: Clean the site well to ensure you are beginning with a clean level surface.

7. Preparing your surfaces for proper adhesion.

a) Concrete – it is important that the surface be completely dry to avoid adhesive failure. IncStores' installation procedure requires that some tiles be permanently fastened to the subsurface. Sufficient curing of the concrete normally requires 10 to 15 days. Less than 3 lbs moisture per 1000 square feet is ideal. Surface must be cleaned prior to adhesion.

Note: If the installation of PlaySafe MUST be carried out before the concrete has sufficiently cured, then certain PlaySafe (perimeter, keystone and strategic rows), must be permanently fastened to the subsurface using mechanical methods. Consult IncStores for options when PlaySafe must be placed on green concrete.

b) Asphalt may require longer curing to allow the oils to dissipate. Most asphalt surfaces contain a significant amount of tars and oil which will prevent sufficient adhesion.

c) Mechanically prepare the area as required. All asphalt areas receiving tile to perimeter adhesive (perimeter tiles, keystone tiles and strategic rows) must be mechanically abraded with a concrete grinder or hand grinder to remove approximately 1/8" and power wash to remove the oils ***(Fig. 11a)***.

PRIOR TO THE INSTALLATION OF TILE

*SEE ADDENDUM FOR CHECK LIST

1. **Measure the site and record dimensions**

2. **Check to ensure non-encroachment zones and fall heights are accurate to the drawings**

3. **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) PlaySafe and PlaySafe 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.

4. **Atmospheric temperature above 40°F (5°C) and rising**

Atmospheric temperatures should be above 40°F (5°C) 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 45°F (7.2°C) for an extended period of time.

5. **Watch for variance in color tones**

PlaySafe 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.

PlaySafe Premium may also undergo a temporary color change due to the effects of UV on the thin layer of binding resin on the top of the surface. The thin layer of binding resin will be influenced by UV causing the tile to temporarily darken or yellow. The color change is normal, expected and temporary. The original color tone will be restored within 4-12 weeks depending on weather and usage.

THE LAYOUT

When preparing for your initial site layout there are some important factors to take into consideration:

- Each PlaySafe KROSLOCK piece is manufactured to a nominal dimension of 24.25 (+/- 1/8")
- The PlaySafe installation process requires that each tile be installed under slight compression to a dimension of 24"
- It is unlikely that the site is perfectly square or exactly as shown in the drawings

Based on these factors, a properly laid out surface may require that the perimeter tiles be cut in.

CHECK LAYOUT DRAWING FROM IncStores as your project may be designed as centered or shifted in one direction or another.

To ensure a visually proportionate site, lay the surface out with similar 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. When possible cut tiles should be a minimum of 10" in width. By properly laying out the surface costly and unsightly errors can be avoided.

1. **Multicolored surface**

Note: IncStores' installation method requires that certain keystone and strategic rows of tile be permanently fixed in place. Once the initial keystone and strategic rows of tiles have been fixed, they will be impossible to remove without damage. In light of this it is imperative to confirm the surface patterns and colors against the shop drawing prior to beginning the layout.

2. **Take proper measurements prior to commencing with installation**

Calculate all finished tile measurements to a dimension of **24**".

Note: On new installations IncStores highly recommends that the site dimensions be designed around a tile dimension of 24" to avoid perimeter cuts.

3. **Ensuring the installation is square**

Measuring from the center line you will need to define a square outside perimeter where the last full tile or ramp edging will be placed. Once the dimension of the outside perimeter cuts have been determined, a chalk line will be used to square the site. Ensuring that the chalk 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. For accuracy, the 3-4-5 measurements should be increased proportionally on larger projects (i.e. 15-20-25).

a) Chalk a line parallel to the retainer edge. The distance between the retainer and the first string line should be equal to the size of the perimeter cuts plus 1/8" to allow for compression.

b) Chalk a second line along the adjacent retainer edge forming an "L" shaped formation **(*Fig. 3*)**.

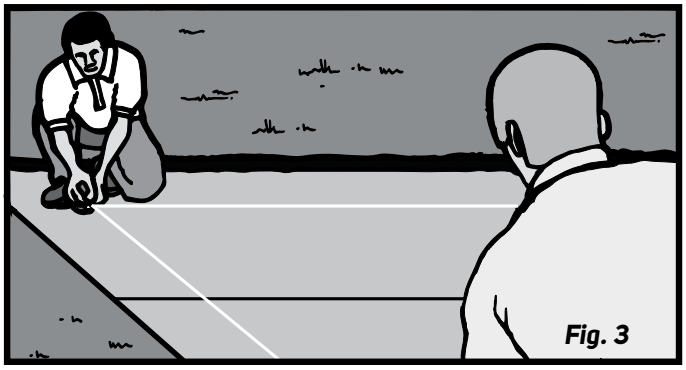
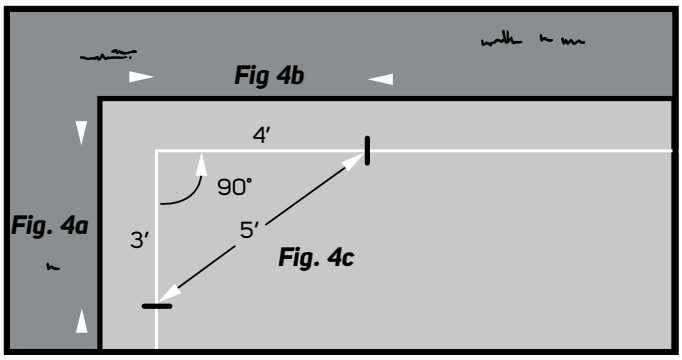


Fig. 3

c) Place a marking 3' down one side of the chalk line **(*Fig. 4a*)**.



d) Place a second marking four' across the perpendicular chalkline **(*Fig. 4b*)**.

e) If the measurement between the two marks is 5', the chalk lines are square (***Fig. 4c***).

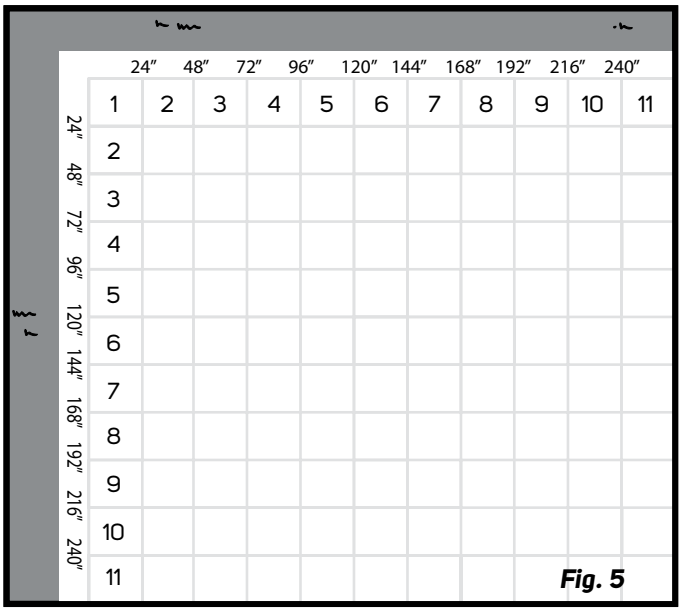
A measurement of more or less than 5' indicates that the chalk lines are not square and will need to be adjusted to the 5' measurement. The decision on how to move the chalk line will depend on the visual effect it will have on the perimeter cuts. When laying out the site, designate the least visible side of the playground for the majority of any uneven cuts.

4. Laying the grid lines

Utilizing IncStores' latest installation method is best accomplished by creating a grid of the entire surface area. Although this method requires additional time at the beginning of the installation, the overall installation process will become more efficient. As installers become more familiar with the layout process they may elect to strike fewer gridlines, particularly in areas with little or no equipment.

a) Begin by chalking lines in 24" increments across the length of the surface **(*Fig. 5*)**.

b) Chalk perpendicular lines in 24" dimensions across the width of the surface **(*Fig. 5*)**. For efficiency some installers prefer to pre-mark their tape measure in 24" increments.



5. Coefficient of thermal expansion

PlaySafe is manufactured from a combination of rubber materials and polyurethane binding resins. The high percentage of rubber materials makes the product highly susceptible to heat-related expansion and contraction. Hot sunny days will cause the tiles to increase in size while cool days will result in contraction of the tile dimensions.

If the installation techniques below are not followed, seasonal temperature fluctuations will put the tile installation under continuous expansion and contraction forces. These forces will result in a high potential for installation deficiencies such as seam separation over a period of several seasons.

On hot sunny days the following guidelines should be carefully followed to minimize the impact of heat-related expansion and contraction of the final installation:

- Keep the tiles stacked, covered and out of direct sunlight prior to installation.
- Remove tiles from the pallet only as they are needed. By keeping the tiles stacked and shaded, the insulating properties of the tile can be utilized to keep the stacked rows of tiles cool and the dimensions close to the nominal 24.25" size.
- Plan to place the final compression rows early in the morning or late in the evening when smaller dimension tiles will make compression easier. *(See **compression section**.)*
- Applying adhesive in the early morning will allow the adhesive to cure while the tiles are expanding throughout the day. This will prevent adhesive failure caused by tile contraction prior to the adhesive curing.
- **For best results, ensure outdoor temperatures, adhesive and PlaySafe are maintained at a temperature above 50° F for 24 hours before and after installation.**
- When the temperatures become such that the increase in tile size is making it difficult to compress the tile to 24", stop. Spend the balance of the day making tile cuts for your perimeter and equipment posts.

6. Installing the surface

IncStores' installation techniques have been designed to apply slight compression to the entire installation. This advanced installation technique has been implemented specifically to counter the effects of heat related expansion and contraction by ensuring that each tile is installed to a fixed dimension of 24". The following sections will introduce new terminology and concepts involving the use of keystone tiles, strategic rows of tiles and compression rows.

Note: The installation techniques outlined in the following sections are mandatory to ensure the surface has been installed to specification.

KEY CONCEPT DESCRIPTIONS

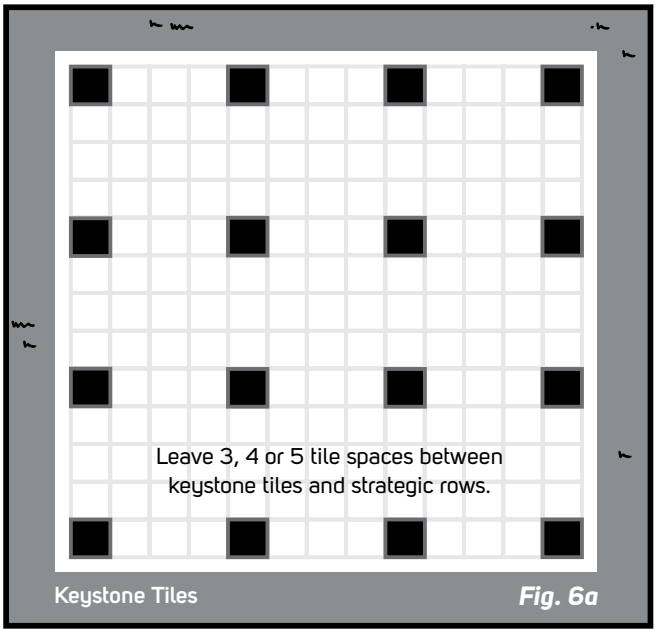
1. Keystone tiles

- Tiles that are permanently fastened to the subsurface in strategic locations throughout the installation are referred to as keystone tiles (***Fig. 6a*** – shown in black).
- Keystone tiles are fastened to the properly prepared subsurface using the perimeter to subsurface adhesive supplied with the order.

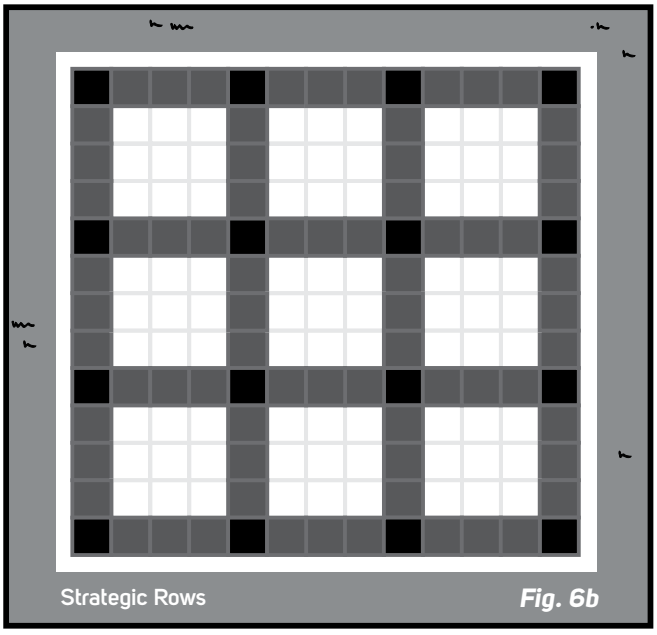
- The purpose of a keystone tile is to provide a fixed point of compression for the outer perimeter and strategic rows of tile.
- In certain instances where site dimensions have been designed in consultation with IncStores, and where a fixed retainer is in place, the quantity of keystone tiles may be reduced. For all other installations keystone tiles are mandatory.
- Keystone tiles are the first tiles to be placed on an installation.

2. Strategic rows

3. PlaySafe installations require specific rows of tile to be fixed in place in order to act as a point of compression.
4. The outermost perimeter of full tiles as well as the rows of tile that fall every 8' in length and width are referred to as strategic rows.
5. Strategic rows of tiles are compressed between the fixed keystone tiles (***Fig. 6b*** – shown in dark grey).



Keystone Tiles ***Fig. 6a***



Strategic Rows ***Fig. 6b***

- Installation of strategic rows assists in breaking large sites into smaller areas that are much easier to compress into place.
- Additionally, breaking large areas into smaller sections provides greater flexibility during the installation process by allowing sections to be compressed and adhered individually during mornings when temperatures are cooler.

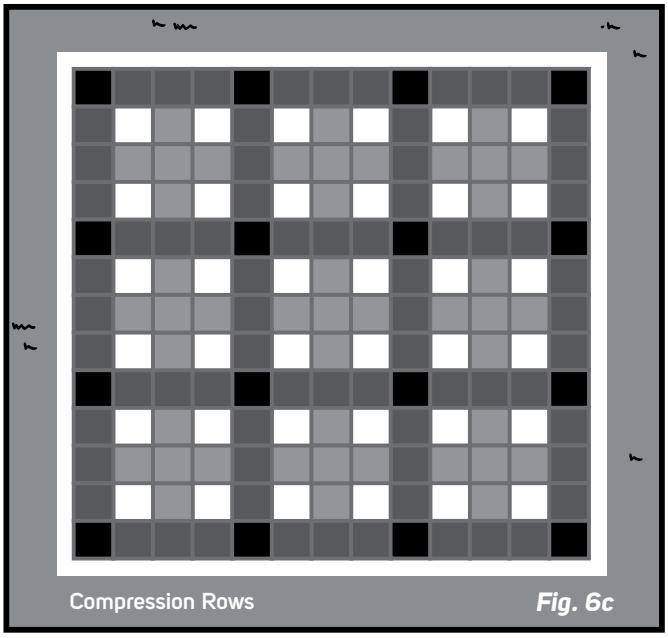
Note: sofRAMPs may also be used as Strategic Rows.

3. Compression rows

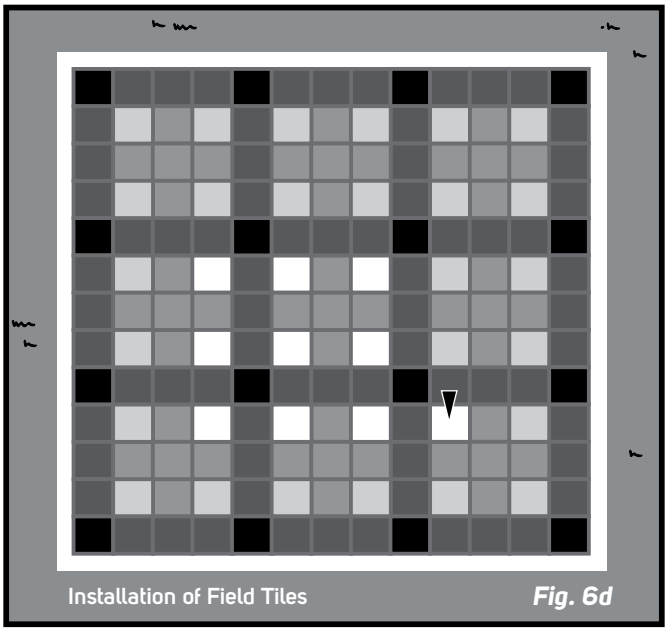
- Compression rows are defined as rows of tile that are installed first before all other tiles have been installed (***Fig. 6c*** – shown in medium grey).

4. Field tiles

- All other tiles are referred to as field tiles (***Fig. 6d*** – shown in light grey), with the exception of the compression row tiles which are installed after the field tiles have been installed.



Compression Rows ***Fig. 6c***



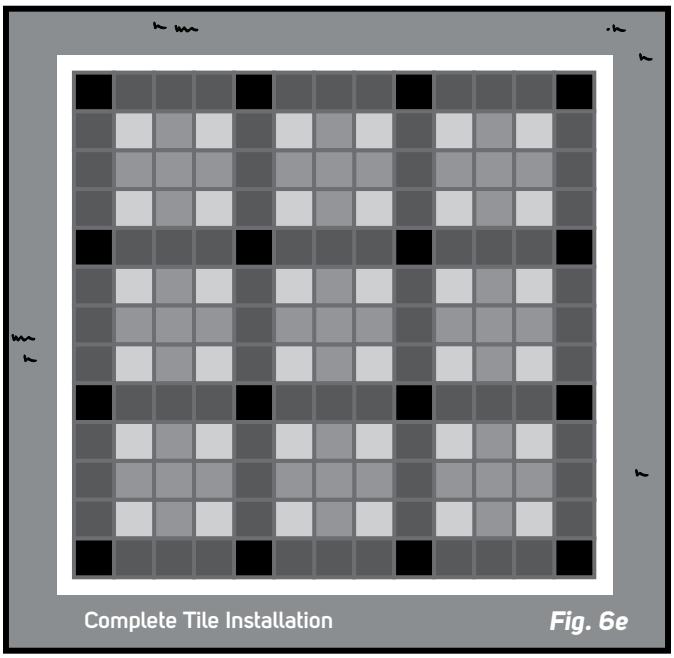
Installation of Field Tiles ***Fig. 6d***

- Field tiles are not adhered to the subsurface.
- Field tiles (along with the rest of the installation) are adhered together at the face edge of the locking joint, at the end of the installation after all tiles have been placed.

IMPORTANT

INFORMATION REGARDING THE PLACEMENT OF KEYSTONE TILE AND STRATEGIC ROWS OF TILE

The location of keystone tiles, strategic rows of tile, and compression rows of tile are placed in locations based on fixed dimensions that have been determined to be most conducive to an efficient installation.



Complete Tile Installation *Fig. 6e*

Keystone tiles and strategic rows of tile are normally calculated to fall every 4 rows (8'), leaving 3 tiles spaces between keystone tiles and strategic rows. Given, however, that each site is unique in size and shape, it is impossible to set keystone tiles and strategic rows of tile at the same dimensions on every installation. For this reason, sofSURFACES has established minimum and maximum spacing for keystone tiles and strategic rows of tile, which normally range from 3 rows to 6 rows.

Additionally, keystone tiles and strategic rows of tile may be shifted to better accommodate factors that are unique to each installation, (e.g. Avoiding areas requiring many playground equipment post cuts). Placing keystone tiles and strategic rows of tile in sections greater than 6 rows can result in difficulty placing the final compression row. Each order will contain a shop drawing that provides suggested locations for keystone tiles, strategic rows of tile and compression rows.

BEGINNING TILE INSTALLATION

Step one – Installation of keystone tiles

Keystone tiles are placed in each of the 4 corners of the installation.

- Since perimeter cuts are generally placed last, each keystone tile should represent a full tile.
- Irregular shaped installations may require some perimeter cuts to be utilized as keystone tiles – refer to shop drawing supplied with order.

Key considerations

- Once keystone tiles are permanently fastened to the subsurface, removal is impossible without damage. In light of this, extreme caution should be taken to ensure that the keystone tiles have been accurately placed in the correct color and location. Confirm dimensions and placement prior to adhesion.
- Keystone tiles must cure enough to prohibit movement before strategic rows of tile are installed. The average set time is 4 hours based on temperature and humidity. Lower temperatures will result in longer cure times. In cooler weather, cure times can be decreased by heating the substrate with a tiger torch prior to placement of adhesive.
- The dwell time for curing can be best utilized by measuring and placing post cuts. Post cuts can be properly cut in only if the entire site has been chalked with gridlines.
- Many PlaySafe installations utilize colorful designs. Be sure to consult the layout before placing the keystone tiles.
- Each project is accompanied by a drawing showing the optimal placement of keystone tiles.
- Begin by trowelling the factory recommended adhesive in a 12" wide swath for the outside edge of the outer row and a 12" square for the center of the tiles within the gridlines that represent the keystone tiles. Adhesive placement can be centered within the gridlines or placed on the outside gridline when working from center.
- Apply adhesive in increments covering only the areas that will receive tiles within 15 minutes of adhesive application.
- Using a speed square, place the keystone tiles over the adhesive ensuring that the keystones tiles are placed square, and precisely within the designated gridline.

Step two – Installation of strategic rows

Strategic rows of tiles are installed between the keystone tiles, connecting all keystone tiles. Installation of strategic rows of tiles should begin at opposite ends of the keystone tiles working inward towards the center (***Fig. 7a***).

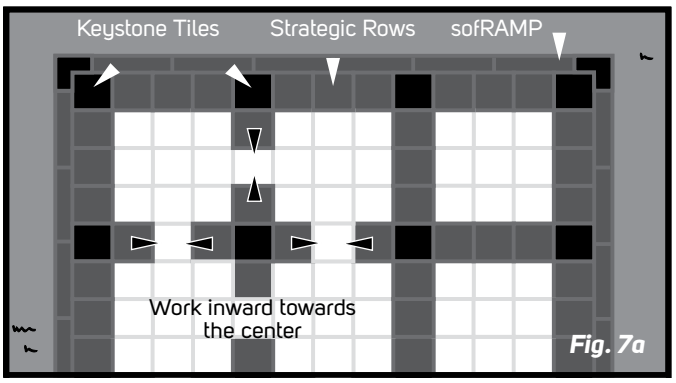


Fig. 7a

The final tile located in the middle of the strategic row is the compression tile and must be compressed into place last.

- Begin by trowelling the factory recommended adhesive in a 12" square within the gridlines that represent the keystone tiles. Adhesive placement can be centered within the gridlines or placed on the outside gridline when working from center.
- Apply adhesive in increments covering only the areas that will receive tiles within 15 minutes of adhesive application.
- Interlock each tile over the adhesive ensuring that the strategic rows of tiles are placed square, and precisely within the designated gridlines.
- Install the final tile by compressing the strategic rows of tiles outwards in each direction towards the keystone tiles.
- Strategic rows can only be installed after the keystones tiles have been adhered and the adhesive has cured.

Note: The final tile must be placed and compressed into each strategic row within the adhesive working time to ensure that the tiles are able to move (compress) before the adhesive cures.

Step three – Compression rows

IncStores' installation method requires that all field tiles are installed from the fixed strategic rows inward towards the center. The center row (compression row) is the first row of tiles to be placed.

PlaySafe® nominal size is larger than the finished compressed size. As temperatures increase, the dimension of the field tiles will increase. Based on these factors the final tile will need to be compressed into a void smaller than the actual tile. This process will require compressing the adjacent tiles outwards in both directions.

Note: Installing the final tiles in the early morning when temperatures are cooler will significantly reduce the labor required to complete compression.

Installation layout using a ramped perimeter

When installing projects that require a sofRAMP perimeter the same core principles of measuring, gridding and compression apply.

All ramped edging can be installed at the beginning of the installation and utilized as the perimeter compression row (***Fig. 7a***).

Adhesion should take place using the PlaySafe to perimeter adhesive included with the order.

Prior to installing the ramped edging accurate measurements will need to be taken based on the finished tile dimension of 24". It is critical that accurate measurements ensure that the ramped edging falls in the exact location based on the finished dimension of the project.

When adhering ramps to the surface, 100% adhesive coverage is required. Once the ramps are adhered to the surface they will be impossible to remove without damage.

Consult the chart located at the back of the instructional guide for quick dimensional references.

When sofRAMP edging is used the fastened and fixed ramp perimeter will become the point of compression negating the need for keystone tiles around the perimeter. The decision to use the fixed ramp or the outer row of perimeter tile as the point of compression is a matter of choice to be made by the installer. Consult IncStores for advice on which option may be optimal for your project.

Keystone and strategic rows of tiles will be required in every 4th row (8'), across the length and width of the site. A shop drawing supplied with the order will indicate the optimal location of keystone and strategic rows of tiles.

Step four – Installing field tiles

IncStores' installation techniques have been designed so that adhesive placement into the locking joint takes place after all of the tiles have been installed, locked in place and properly compressed.

Our unique interlocking system was designed for ease of installation. To maximize speed and efficiency install all KROSLOCK tiles in the following manner:

- Hold the tile at a 90 degree angle to the tile in front of it
- Slide outer lock over inner lock and set down
- This will secure 3 of the 4 locks
- Secure the final lock by lifting the adjacent tile
- Once all 4 locks have been secured, align the seams with all of the adjacent seams.

The installation of field tiles will continue as shown in ***Fig. 6d***.

Tiles can be compressed only after the PlaySafe to subbase adhesive has cured, thus permanently fixing the strategic rows in place. 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 sledge hammer or the heel of the foot to force the tiles tight.

If physical force does not position the tile properly, rotate the tile into an alternate position which will in most cases ensure a proper fit. A proper installation will have straight, tight seam lines with no gaps between tiles.

MARKING AND CUTTING TILES

Perimeter Cutting

For curved cutting, using a tape measure or square, begin on the edge of the perimeter where the tile will be placed and take a measurement from the edge of the perimeter to the edge of the last placed full tile or grid line. Transfer this measurement onto the tile that has been selected to be cut (***Fig. 8a***). Add 1/16" to the measurement.

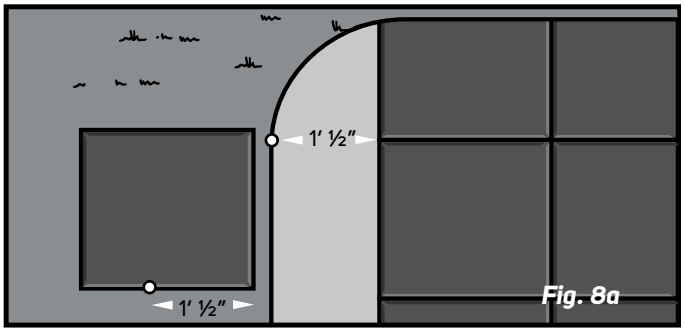


Fig. 8a

Move the tape measure approximately 3" 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. 8b***). Continue this process until enough references points have been transferred onto the tile (***Fig. 8c***).

Straight, regular cuts may only require two measurements per tile; however, irregular perimeters such as circles will require measurements in 3" increments across the tile.

Flex curves, squares, templates and other tools may also be used to more efficiently measure and lay out irregular cuts.

After the measurements have been transferred onto the tile to be cut, connect the markings using an aluminum straight-edge and felt-tip marker.

Always cut your tile through the mark or inside the mark, ensuring that the cut tile is slightly larger than required.

Since PlaySafe is made from a flexible material the larger piece can be compressed into the opening ensuring a very tight fit.

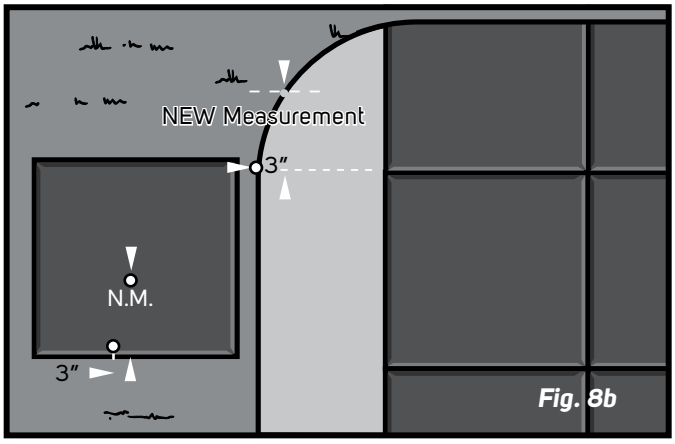


Fig. 8b

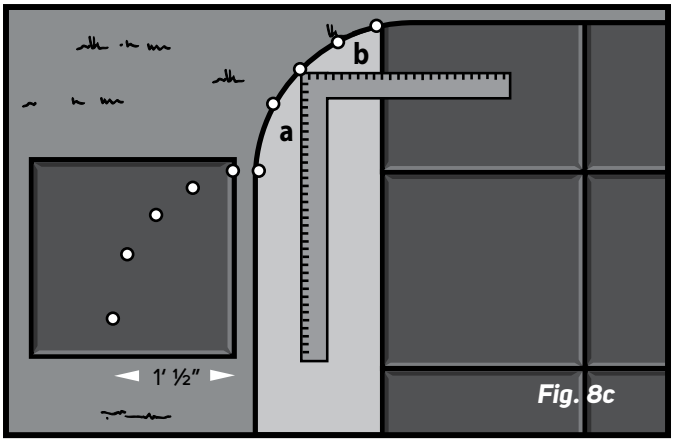


Fig. 8c

To ensure the tightest possible fit, all cuts should be made on a 15-20 degree backward angle (***Fig. 8d***).

In the event that a full tile is placed against a retainer, it will be necessary to remove the "outer" lock to allow the tile to fit flush.

Once the outer lock is removed place it under the "inner" lock to provide additional support and stability (***Fig. 8e***).

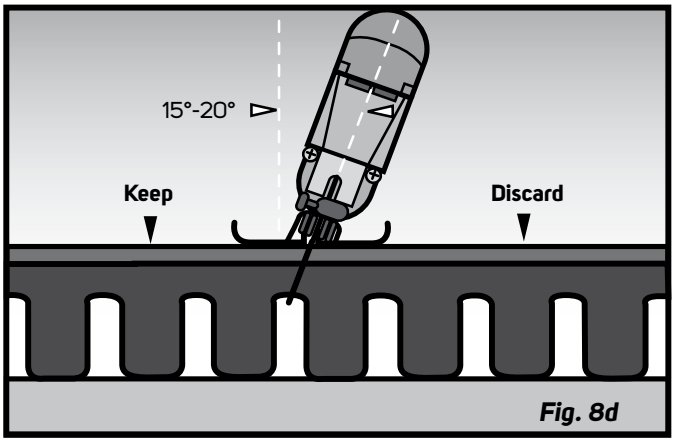
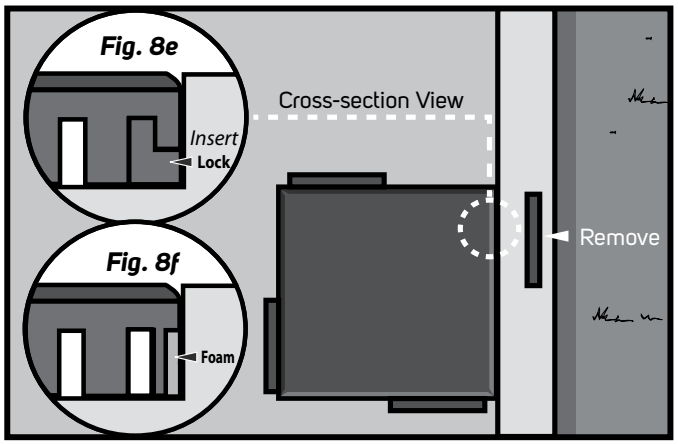


Fig. 8d



Overhead View

Note: Anytime a cut is made through a pedestal on the underside of the tile, structural foam must be used to provide additional support (Fig. 8f). Recommended foam includes Handi Foam available through IncStores or Great Stuff Door and Window Sealant, which is available at most local building supply stores.

MARKING AND CUTTING POSTS

Installing tiles around equipment posts prior to laying the field tiles will provide for a more efficient installation by allowing work to continue while keystone tile adhesive is curing.

The diameter of playground equipment posts varies across the industry. The diameter of an equipment post can be calculated by measuring the circumference of the post and multiplying by .31831.

2 squares laid over each other in a U-shape can also be used to quickly calculate the diameter of the post.

If there are many playground equipment posts to be cut around, templates must be made based on the various post sizes.

For easy visual reference place the tile to be cut near to and in a similar orientation to its final placement position (***Fig. 9a***).

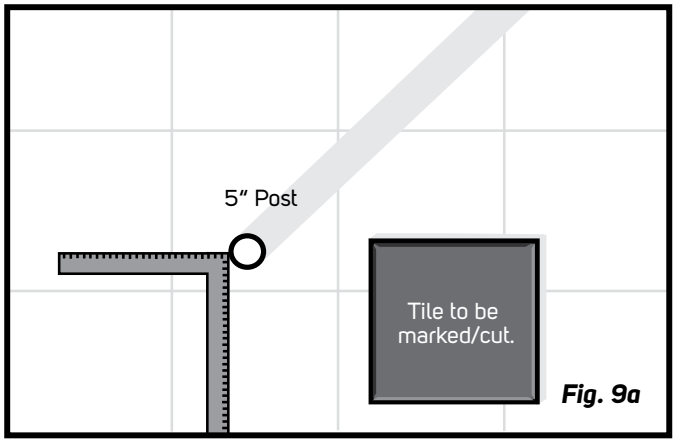


Fig. 9a

When measuring for a post, cut the minimum of a single mark for each of the vertical and horizontal locations of the post hole is required. With these two marks made the template can be located and the circle drawn.

Measure the distance of the void between the edge of the post and the edge of the adjacent gridline or tile (***Fig. 9b***).

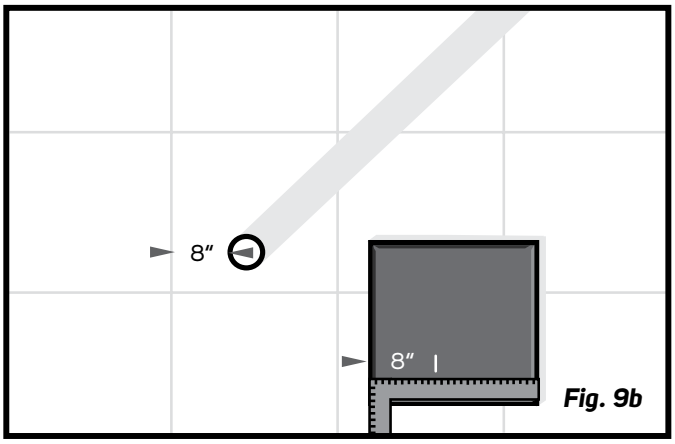


Fig. 9b

Transfer this measurement onto the tile to be cut by marking the tile in the form of a line approximately ½" or a dot (***Fig. 9b***).

Once the horizontal measurement have been made, use the same method for the vertical measurement based on the distance from the edge of the post to the adjacent gridline. Transfer the marking onto the tile to be cut.

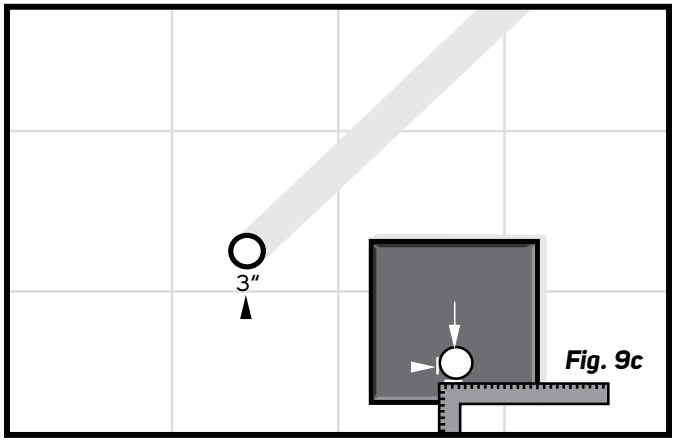


Fig. 9c

Place your template into the center of the markings and outline the perimeter of the template (***Fig. 9c***). You are now ready to make your cut.

Tips:

- A cut into the side of the tile must be made before the circular post is cut. When doing so, always cut the side of the tile that represents the shortest distance from the tile edge, or place the cut where it will be hidden by equipment. When possible, the cut should be made between pedestals which may result in a cut that is slightly off center, but provides structural stability.
- Since PlaySafe is flexible, always make the hole cut slightly smaller (⅛"), than required to allow for a very tight fit.
- Making the post cuts on a backward 15-20 degree angle where it meets the surface allows for a tight neat appearance and provides some additional flexibility (***Fig. 8e***).

- Hole cuts must be made using a template and jigsaw.

Note: The accuracy of your post cuts will be entirely dependent on precise placement of the gridlines. Take care to ensure that the gridlines have been laid out to the exact dimension and accurate measurements from the gridline to the post.

CUTTING TILES

Most straight cuts can be made with a utility knife. When using a utility knife place the tile on a level surface and score the area to be cut with an initial pass of the knife. Once the score has been made, apply pressure to the tile to open the score. Placing the tile over a 2x4 or allowing the edge of the tile to hang over a table top will assist in opening 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 jigsaw can also be used to make straight and irregular cuts. When using a jigsaw, always score the tile with a utility knife or circular saw first.

All cutting should be done in a 15-20 degree back angle. Always use a jigsaw blade that is ¼" shorter than the thickness of the tile.

It is easiest to cut tiles when the tile is laying flat on a stable surface.

ADHERING TILES

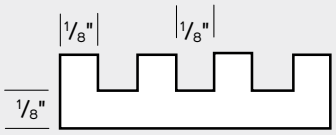
PlaySafe unique locking design provides a mechanical means of securing the system. The locking system, however was engineered to be effective only when installed with the proper quantity and placement of adhesive.

Key points

- Proper application of adhesive to the KROSLOCK joint is critical to the overall performance of the PlaySafe system and is mandatory for all outdoor applications.

- Using too little adhesive, or applying the adhesive in the incorrect location will result in failure of the locking system, and will void the lifetime warranty.
- Only use adhesive provided by or recommended by the manufacturer.
- Only use the application equipment provided by the manufacturer.
- Sealing the entire length of the seam will prevent damage caused by the migration of sand and other loose particles into the seams of the product.
- Surface temperatures above 40° F and rising are recommended. Avoid temperatures below 40° F and above 105° F.
- Surfaces must be clean and completely free of moisture, morning dew, or frost.
- Adhesive heated to 75-80°F.

Recommended Trowels for Maximum Performance



1/8" x 1/8" x 1/8" – Coverage 45 ft² per Gallon

- Trowel size is suggested to maximize coverage of adhesive. Periodically check coverage of adhesive during installation. Uneven surfaces may require the use of either a leveling/patching material, or a larger notched trowel for proper coverage of adhesive. Ensure sufficient material ordered.
- A 3/16" x 3/16" x 3/16" V-notch trowel may also be used.

1. Checklist prior to application

Prior to beginning the adhesive application process, the following checklist should be verified. Any corrections that need to be made will be much easier prior to the application of adhesive.

- Check your layout and the drawings to ensure that your installation represents the intended design. Check that all of your rows are straight, and that all of the seams are properly aligned.
- Ensure that the surface has been compressed to the correct dimension.
- Make sure your perimeter and post cuts are tight and neat.
- Verify that the tiles are clean and dry.

2. Adhesive placement locations

Adhesive application methods vary slightly depending on the type of installation and the substrate that the system will be placed on.

Regardless of the substrate used however, all PlaySafe systems have minimum adhesive application requirements.

3. Tile to tile adhesion

Tile to tile adhesive must be properly placed on the vertical wall of the interlocking joint and NOT in the bottom of the u-shaped locking system (***Fig. 10a***).

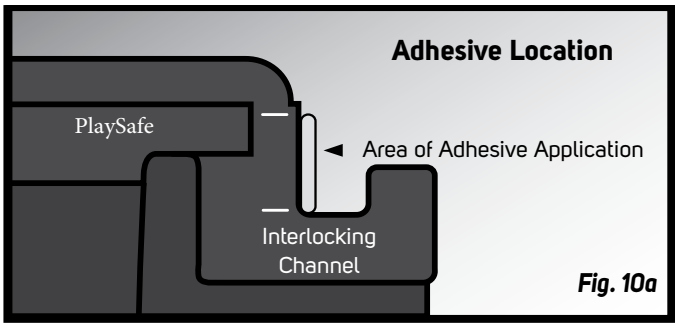


Fig. 10a

Placing the correct amount of adhesive onto the proper location of the product will ensure the long term success of the installation.

4. Preparing the equipment

In order to minimize any potential mess during seam adhesive application, a small set up area should be created using a piece of cardboard or other disposable covering material. Prior to beginning the seam adhesive application process, make sure you have rubber gloves, rags, a knife and appropriate cleaning solutions for clean up purposes ***(see page 1)***.

a) Open the dispensing unit by unscrewing the tip and cap.
b) Pull the notched dispensing arm out to accommodate the seam adhesive tube.
c) When inserting the seam adhesive tube, leave 3"-4" exposed.
d) Using scissors or a knife, cut the entire tip off the tube, and discard the end.
e) Hold the dispensing unit upright to allow the tube to slide entirely into the unit.
f) Assemble the tips and cap ensuring that they are tightly screwed into each other and the dispensing unit.

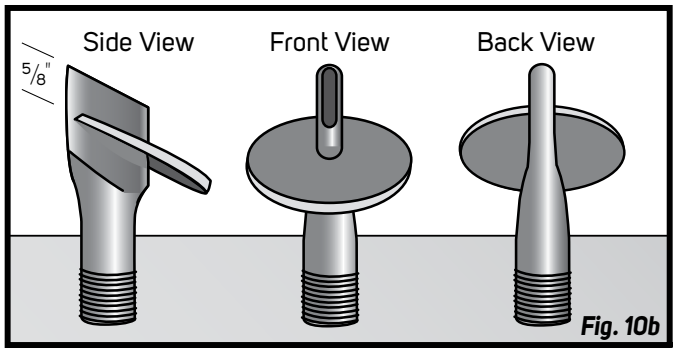


Fig. 10b

5. Application nozzles

You will notice that the adhesive application tip has been custom designed for use with the KROSLOCK system (***Fig. 10b***).

The tip has been designed to control both the depth and placement of the adhesive. Although the tip has been designed to minimize seepage, careful attention must be paid to ensure that the correct amount of adhesive is being applied. Too little adhesive will affect the performance of the locking system. The correct amount of adhesive will rise to flush with the seam lines.

6. Adhesive application techniques

- Adhesive is to be heated to 75-80°F prior to use.
- Insert the custom applicator tip into the seam of the tiles until the depth guide (washer) comes in contact with the top of the tiles (***Fig. 10c***).
- Do NOT move tip until adhesive begins dispensing.
- Begin applying the adhesive between the tiles ensuring that the appropriate amount of adhesive is being applied to each tile. If adhesive begins to seep from the seams of the product adjustments will need to be made to your pressure and speed.
- The ideal quantity of adhesive will provide sufficient contact to both sides of the tile and will rise flush with the top of the seamline.
- As a general guideline, select the 2.5 to 3.0 setting on the power dispenser and start with a travel speed of one tile length every 5 seconds.
- **Adhesive coverage must always be verified by measuring against the recommended coverage of 40 lineal feet per tube.**

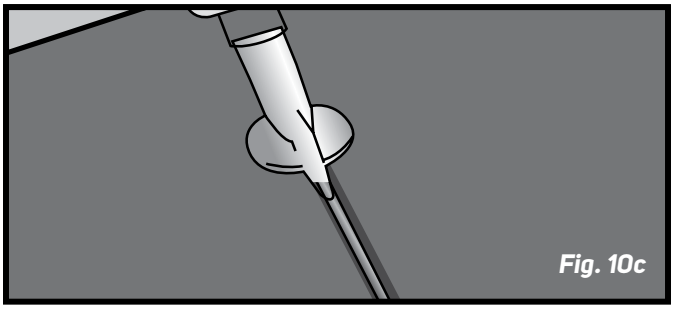


Fig. 10c

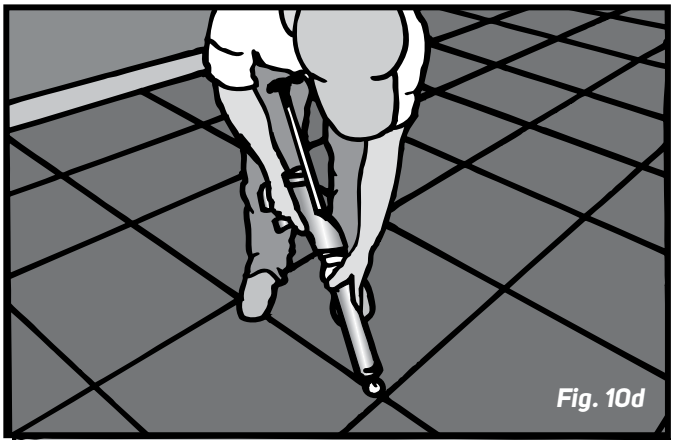


Fig. 10d


Fig. 10e

- Since adhesive flow rates can be affected by temperature, adjustments to travel speed may be needed based on the actual adhesive coverage achieved.
- Any excess adhesive should be left to fully cure prior to removal the following day. The excess adhesive can be quickly and neatly removed using a sharp razor knife.

Key points

- When removing the tip from the seam be sure to have a rag available. Twist and wipe tip while removing.
- Apply adhesive to an entire row at a time, keeping track of the rows you have completed (chalk mark, etc.).
- **Always mark the last location where adhesive was placed prior to refilling adhesive gun.**
- To prevent blockage from cured adhesive, the application should take place in both directions representing the length and width of the site within a short time period of each other.
- **Under no circumstances should a PlaySafe system be installed outdoors without the use of adhesive.**
- All adhesive supplied with the order should be completely consumed.

7. Tile to subsurface adhesion

Keystone tiles, perimeter edging (ramps or tiles), and strategic tile rows are to be permanently adhered to the subsurface.

SURFACE PREPARATION

1. Concrete surfaces

- All surfaces should be clean, dry and structurally sound.
- Concrete surfaces should be cured for a minimum of 10 to 15 days or until the moisture content is between 4-6%.

2. Asphalt surfaces

- Asphalt surfaces contain a high percentage of oils that are highly detrimental to adhesion performance.
- Attempting to adhere to new or recently coated asphalt without grinding **will** result in adhesive failure.
- New asphalt or recently coated asphalt **must** undergo a light abrasion to remove the oils that are resistant to bonding. Lightly grinding the surface will expose the aggregate faces that are embedded in the asphalt matrix.
- This process is best achieved using a walk-behind scarifier or hand-held grinder (***Fig. 11a***).

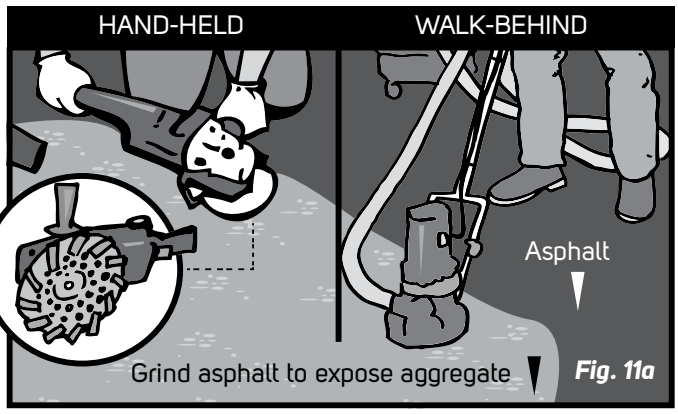


Fig. 11a

Adhesion is achieved by using the tile-to-base adhesive supplied with the order. This subbase adhesive is a high strength adhesive designed to provide a permanent bond between two structurally sound materials. It is most imperative that the instructions supplied with the material are followed correctly.

Keystone tiles, perimeter edging, and strategic rows of tiles are to be permanently adhered to the subsurface by applying the manufacturer supplied adhesive using a notched trowel.

For RAMPS:

- Apply adhesive to ramp and secure in place.
- Once in position, mark location of pilot holes: **For ADA Ramps:** inset from ends by 2", inset from toe of ramp by 1" and spaced out every 7.5". **For sofRamps**: inset from ends by 2", inset from toe of ramp by 1" and spaced out every 11".
- Drill through and into the asphalt with a 3/8" masonry drill bit.
- Insert 1/4" x 2 3/4" masonry anchor screws with corrosion resistant coating into holes and counter sink by 1/8" below surface of the ramp until adhesive squeezes out. Philips head screws are preferred.
- Add a dab of Sika to the top of the screw head.

NOTE: An asphalt subsurface with a minimum of 4" of thickness is required. Must be cured for 28 Days and scarified for proper adhesion.

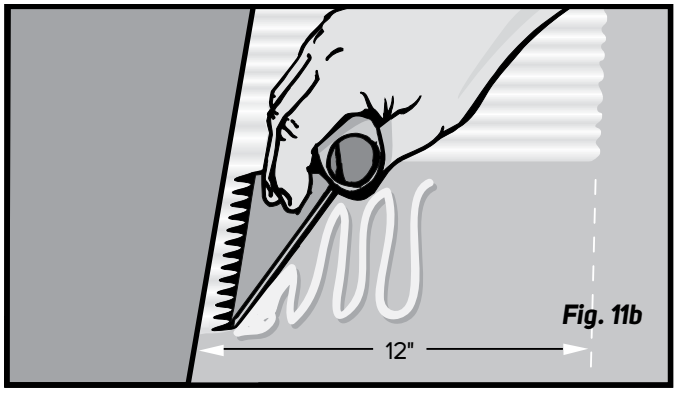


Fig. 11b

3. Transitional edging adhesion

When a sofRAMP transitional edge piece is used, adhesive must be placed both between the tile and sofRAMP, and between each sofRAMP edge using the applicator tip. Adhesive will also be placed between the sofRAMP and subsurface using the manufacturer supplied subsurface adhesive and a notched trowel (***Fig. 11b***).

sofRAMP perimeter edging is adhered to the subsurface using the perimeter to subsurfaces adhesive supplied with the order.

Care must be taken to ensure that the adhesive does not seep outside of the coverage area which in some cases may requiring taping.

sofRAMP perimeter edging is adhered to the tile using the same procedure as tile to tile adhesion (***Fig. 11c***)

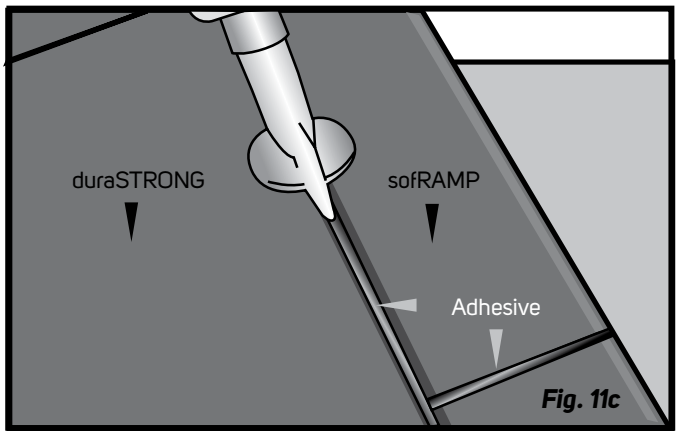


Fig. 11c

4. Playground post cuts

Adhesive must be applied to the initial straight cut leading into the circular cut (***Fig. 11d***).

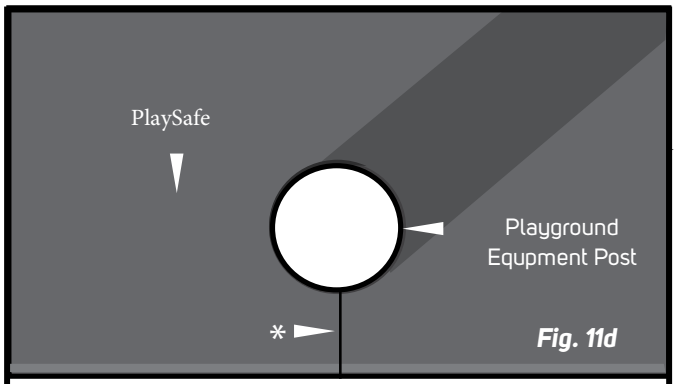


Fig. 11d

* Adhesive to be applied to the initial straight cut leading into the circular cut.

5. Adhesion under decks

Some areas of the playground such as under low elevation playground equipment decks will be impossible to adhere using the applicator tip. In these instances, adhesive must be placed on the vertical wall of the locking joint prior to positioning the tile in place. Cut tile may 'bubble' under compression and may need to be glued down.

For most decks you can use a modified extension on the glue gun as shown in ***Fig. 11e***.

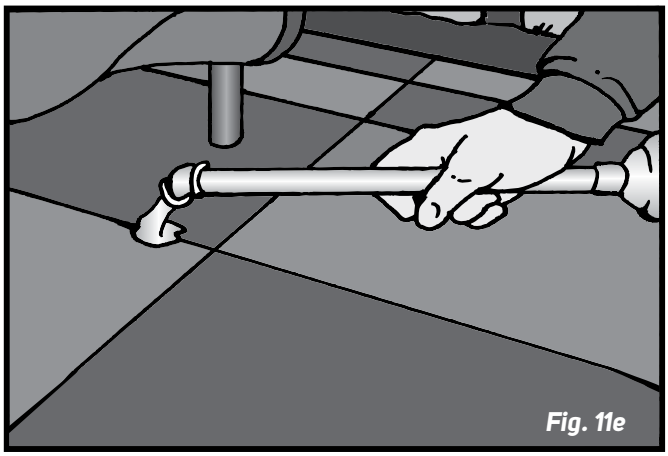


Fig. 11e

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 WD40, GoofOff (red can), or other suitable solvent. Use proper handling procedures. Try to "lift" the adhesive if possible from the surface.

b) ***"Bead-shaped" adhesive spill***

If any seam adhesive inadvertently drips out of the end of the caulking tube onto the PlaySafe surface, and this seam adhesive lies on the tile in a convex shaped bead, with extreme caution it can be lifted immediately (do not smear) with a cloth or knife. If unable to lift, it should be removed only after it has partially cured. The area will need to be protected so the area is not walked on.

After curing, you will need to use a knife to "scrape" the bead off of the tile.

2. Initial appearance and maintenance

Solid PlaySafe 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 granules 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. The rubber may also have an odor.

4. Sealant

It is IncStores' recommendation not to apply sealants to any PlaySafe surface. However should you have any questions about sealing or coating the surface of the PlaySafe product please contact our office.

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 PlaySafe surface.

2. Regular cleaning

Sweeping or blowing the surface off with a leaf blower should be done regularly to ensure that abrasive materials, such as sand, are removed from the PlaySafe surface.

3. Vacuum

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

4. Cleaning agents

PlaySafe 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. Use only pH neutral based cleaning agents that do not contain bleach, or citrus.

ADVANCED MAINTENANCE

Depending on frequency of use, PlaySafe 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. Wand tip should be kept a minimum of 8" from the surface to prevent damage.

SUMMARY

- Proper application and quantity of adhesive to the KROSLOCK joint is critical to the overall performance of the surfacing system.
- 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.
- All adhesive supplied with the order should be completely consumed at the end of the installation.

Closing statement

The entire IncStores' team wishes to thank you for your careful consideration and decision to purchase a PlaySafe safety surface system. Your investment in a PlaySafe system is a wise one.

We work hard to produce the highest quality products and our dedication to customer service does not end with the sale of our surfacing. As industry leaders we are committed to the long-term success of your project.

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