



# Installation and Maintenance

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## 1. Introduction

- LIMIX is a lime-based non-baked ceramic tile made from Shikkui and other natural materials, and should be handled in a similar way as natural stone tiles, such as marble and limestone.
- LIMIX is a brittle material just like natural stone, and hence it is essential to prepare a smooth surface where the tiles are to be attached or laid. If the tiles are to be laid on a floor, it must be solid and not have any flexibility.
- LIMIX contains lime, and therefore may effloresce if water remains in contact with its surface for a long period of time. Please avoid water splashes.
- If you plan to drill a hole in LIMIX after attaching it to the wall, for the purposes of setting a rail, mirror or other apparatuses, overall adhesive attachment is recommended. Bond attachment may result in cracking due to the drilled hole or placement of apparatus.

Location of application	Method	Conditions
Interior walls	Bond attachment	Mortar base, board base
	Overall adhesive attachment	Cut the product no larger than 200 mm, if a hole is planned to be drilled after LIMIX has been attached
Interior floor	Bed mortar	Concrete
	Overall adhesive attachment	Plywood base

## 2. Handling precautions

- After applying liquid cement mortar to joints, clean the tiles immediately, wipe and dry it well. Otherwise, remaining mortar may result in stains.
- Never wash the tiles with acid, because acid causes damage and stains. Use neutral detergent for washing.
- If you use cement mortar or slurry, white cement is recommended.
- Remove curing tapes quickly after curing, to avoid the forming of tape marks on the tile surface.
- Also avoid tapes with extreme sticking power.
- Take appropriate precautions to avoid condensation during construction.
- If you apply curing after the attachment of the tiles, clean them well and confirm that there is no water or other objects on them.
- For cutting, use Alpha Libero-100 – a cutting blade specifically designed to cut Limix tiles without chipping and cracking commonly associated with the dry cutting process, while carefully considering the specific composition of this material.



Comparison of Alpha Libero-100 (left) and typical natural stone cutting blade used on Limix

Manufacturer	Alpha Professional Tools
Product Name	Libero-100
Part No.	AA70022
Specific Application	Limix tiles
Cutting Disc Diameter	4" / 100mm
Arbor	0.8" / 20mm
Tool Thickness	0.032" / 0.8mm
Cutting Edge Thickness	0.056" / 1.4mm

### 3. Application to interior walls

#### 3.1 Bond attachment

##### ◆ Procedures

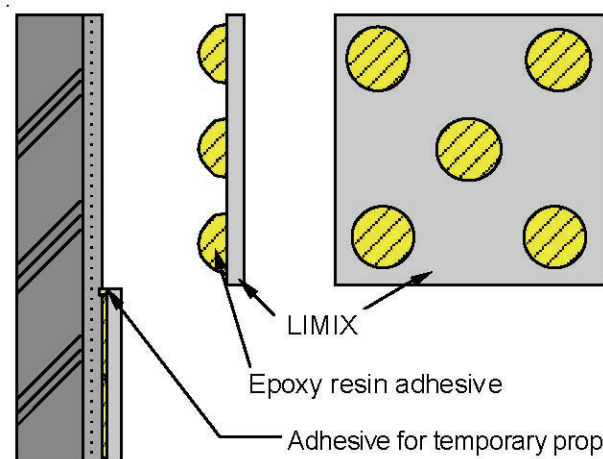
- ① Use epoxy resin adhesive for stone.
- ② Clean the attaching surface of the base material.
- ③ Apply adhesive in balls to the back of LIMIX, and attach it while making fitting adjustments.
- ④ To prevent the tile from dropping, apply a temporary support to the top and sides of the product with quick setting epoxy resin adhesive and backup material.
- ⑤ Do not attach tiles to higher levels before the setting of the adhesive for temporary support.
- ⑥ Wait at least one day and confirm that the adhesive is sufficiently set, before filling the joints between the tiles. The joint width must be 3 mm or larger. Do not apply the non-joint method, to avoid cracks or peeling. If you need narrower joints, do not use jointing material and examine well the possibility of base displacement and other risks in advance.

##### ◆ Notes

Bond attachment cannot be applied in bathrooms or similar locations.

The height of application shall be within 6 meters.

If you drill a hole after the attachment of the tiles, apply the adhesive over the complete back of the tile to avoid cracking.



##### ◆ Examples of materials

Adhesive :	Inament E-73, INAX EPS-20, Tilement
Adhesive for temporary prop :	Quick Mender, Konishi
Joint material :	Super Clean, INAX

\* Follow the instructions and procedures specified by respective manufacturers

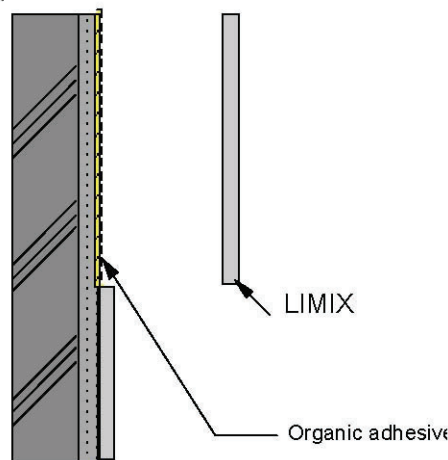
### 3.2 Overall adhesive attachment

#### ◆ Procedures

- ① Check the precision and dryness of the base surface, and clean the attaching face well.
- ② Apply adhesive to the base surface with a comb trowel. Limit the single application to an area attachable within the specified time.
- ③ Press in the tiles from bottom to top with hands.
- ④ Wait at least one day and confirm that the adhesive is sufficiently set, before filling the joints between the tiles. The joint width must be 3 mm or larger. Do not apply the non-joint method, to avoid cracks or peeling. If you need narrower joints, do not use jointing material and examine well the possibility of base displacement and other risks in advance.

#### ◆ Notes

- If adhesive is squeezed out of the joints or attaches to the tile surface, wipe it clean immediately.



#### ◆ Examples of materials

Adhesive :	Inament E-73, INAX EPS-20, Tilement
Adhesive for temporary prop :	Quick Mender, Konishi
Joint material :	Super Clean, INAX

*\* Follow the instructions and procedures specified by respective manufacturers*

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## 4. Application to interior floors

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### 4.1 Bed mortar method

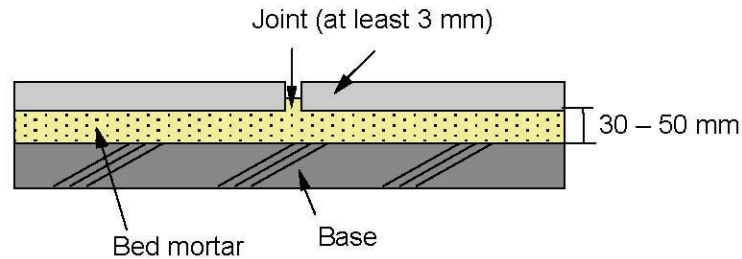
#### ◆ Procedures

- ① Clean the attaching surface of base material well. Particularly remove any oil.
- ② Apply bed mortar (cement : sand = 1 : 3), and smooth its surface to make it level.
- ③ Put the LIMIX tile temporarily, hammer it in well with a rubber hammer for surface adjustment.
- ④ Remove the tile, and apply cement paste evenly all over its surface.
- ⑤ Put the LIMIX on the base immediately. Pat it with a rubber hammer over a patting board, and adjust for evenness of the tile surface.
- ⑥ Wait at least one day and confirm that the adhesive is sufficiently set, before filling the joints between tiles. The joint width must be 3 mm or larger. Do not apply the non-joint method, to avoid cracks or peeling.

#### ◆ Notes

- Confirm that the base does not contain excessive moisture. Make sure that the bed mortar is at least

- 30 mm thick. Check whether there are factors for reducing this thickness, such as piping.
- The bed mortar method is not applicable to bathrooms or similar locations.



#### ◆ Examples of materials

Joint material :	Super Clean, INAX Inameji, INAX
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\* Follow the instructions and procedures specified by respective manufacturers

## 4.2 Overall adhesive attachment

#### ◆ Notes on base material

If a plywood base is used, the influence of vibration and contraction will be relatively large. Therefore, the same precautions must be applied as with large tiles and natural stone.

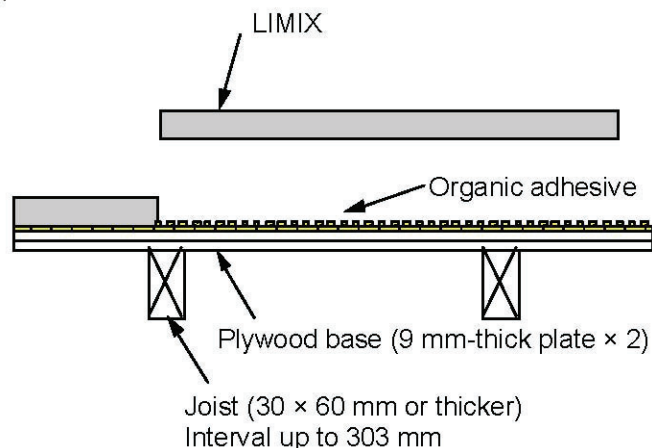
- ① In a joist structure, use joists of 30 mm × 60 mm or thicker, with the interval between joists at 303 mm or less.
- ② If you use plywood, a double application of Class 1 plywood plates at a thickness of 9 mm is recommended. Arrange the plates so that the joints on the top and bottom will not meet.

#### ◆ Procedures

- ① Clean the attaching face of base well.
- ② Apply adhesive to the base surface with a comb trowel with about 5-mm teeth.
- ③ Attach the LIMIX so that its overall surface is pasted. Adjust for evenness around tile patterns with a tile vibrator.
- ④ Wait at least one day and confirm that the adhesive is sufficiently set, before filling the joints between tiles. The joint width must be 3 mm or larger. Do not apply the non-joint method, to avoid cracks or peeling.

#### ◆ Notes

- ① High-elasticity adhesive is recommended.
- ② High-elasticity joint material is recommended.



◆ **Examples of materials**

Adhesive :	Inament E-73, INAX EPS-20, Tilement
Joint material :	Super Clean, INAX

\* Follow the instructions and procedures specified by respective manufacturers

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## 5. Surface protection and Maintenance

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- LIMIX is a ceramics product made from Shikkui and other natural materials, and requires appropriate surface protection and maintenance after application just like natural stone such as marble and limestone.
- Please note that LIMIX tiles applied to the floor will change their feel over time, just like stone.
- LIMIX tiles become slippery when wet. Put mats to prevent the tiles from becoming wet if they are installed in locations where this is likely.
- LIMIX contains lime, and therefore may form stains if water attaches to its surface for a long period, just like natural marble or limestone. Wipe off water or other liquids immediately.

### 5.1 Surface protection

LIMIX requires surface protection just like marble and limestone tiles, to avoid the gradual forming of stains. Apply permeable protective agent or wax for stone immediately after the attachment of tiles.

◆ **Permeable protective agent**

- After the initial application, it is recommended to re-apply the permeable protective agent regularly about every six months (varies by location of use, status of stains and surrounding conditions).
- Example agents

Permeable protective agent :	Clestone, Miyaki Clear Coat, INAX
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◆ **Stone wax**

- Clean the tiles with wax detergent if you find major stains and scratches, wash the tiles with clean water, dry them well, and re-wax them. If stains and scratches become more serious, remove the wax with wax remover, wash the tiles with clean water, dry them well, and re-wax them.
- Example waxes

Stone wax :	Procoat for stone floor, Rinrei Nonheal Neo, Rinrei
Detergent :	NeoRaclean, Rinrei
Remover :	Stamina Pro, Rinrei

### 5.2 Maintenance

◆ **Normal maintenance**

- Clean off sand, mud or other objects regularly, and dry light stains with a soft cloth.
- Wipe off normal stains with a damp wrung cloth, and after wipe the tiles well with a dry cloth.
- If a stain does not come off, use a neutral detergent, wipe the tiles with a wet cloth, and wipe them again well with a dry cloth.
- Beverages, seasoning, oil or similar liquid must be wiped off immediately. If such liquid is left on the tiles, staining may result. In particular, fruit juice or alcohol may damage the surface of LIMIX, and change its feel.
- Objects and stains become difficult to remove if left for a long time. It is essential to clean objects and stains off immediately.
- Never wash the tiles with acid, because acid causes damage resulting in stains and change of surface feel.

◆ **How to remove stains (Not applicable to waxed tiles)**

- Handling marks and pencil markings may be removed with an eraser.
- Chlorine bleach is effective for coffee and soy sauce stains. Dip cotton pads or similar cloths in bleach, and pile on top of the stain. Remove the cloth pads after about 10 minutes and wipe the tiles with a slightly wet cloth. Do not leave the pile of cloths longer than necessary. A stain that does not come off after repeated tries may be an efflorescence.
- Wipe aqueous ink stains lightly with a cloth dipped in neutral detergent or chlorine bleach, and wipe them again with a slightly wet cloth.
- Light oil-based ink stains may be removed by the above method of cloths with chlorine bleach. If the method is not effective, the stains require cleaning by organic solvent. It is recommended to hire a professional cleaner, because pigments may permeate into LIMIX tiles and spread through the cleaning process.

Cleaning by a professional cleaner is recommended for persistent stains, spots and efflorescence.

◆ **Do not use any of the following cleaning materials, as damage to the tile surface and change in feel will result**

- Acid detergent
- Cleanser, glass cleaner or other abrasives
- Wire wool, sandpaper, etc.
- Cleaners containing oil, chemical dusters