

# **PORCELAIN PAVERS INSTALLATION GUIDE**







#### Dear Customer,

Thank you for choosing Evo\_2/E™, the first porcelain stoneware to have a thickness of 20mm (¾"), produced and marketed by Mirage® as a complete project for outdoors and gardening.

A complete system of floorings and special pieces for public and residential outdoor spaces that provides a wide range of sizes, colors and finishes and different modes of application.

This manual was conceived from the desire to provide our customers valuable tips for laying the material; a simple and exhaustive tool, in order to obtain the best result in terms of appearance and quality.

The information contained in this guide is the result of the experience acquired from Mirage® and the daily interaction with professionals of the sector.

Mirage® nevertheless invites you to comply with the local laws and regulations of each individual country to produce flooring in accordance with the best working standards. We also recommend you carefully assess the characteristics of the substructure before doing any type of machining or installing.



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- 12 20 MM (¾") FIXED PEDESTAL INSTALLATION ON CONCRETE FLOOR (PEDESTRIAN FOOT TRAFFIC)

# PORCELAIN PAVERS INSTALLATION INFORMATION

# INTRODUCTION:

Mirage® EVO\_2/E™ porcelain pavers are formed by pressing, followed by vitrification: this process involves the total fusion into a single material made from natural raw materials (sand, quartz, feldspars, kaolin, clays and inorganic pigments) which, fired at temperatures above 1230°C (2240°F), are transformed into a **product with exceptional hardness, ultra-low absorption rate and unmatchable mechanical characteristics.** 

Mirage<sup>®</sup> EVO\_ $2/E^{\text{M}}$  porcelain pavers are eco-compatible and ecolabel-certified. Each unit is **20 mm (0.7874") standard thickness or %" nominal thickness** and is durable enough to withstand use in exterior applications.



# PORCEI AIN PAVERS ADVANTAGES



#### Freeze thaw resistant

They are 100% frost-free and their properties remain unaltered at temperatures ranging from -50°C to +60°C [-60°F to +140°F].



#### Color durability

Aggregate is not seen if chipped/scratched due to color throughout unit.



#### Easy installation

Perfect fit and for fast installs.



#### Low absorption rate

Spills, salt and other materials will not seep into pours.



## Easy to clean

Household cleaners can be used to wipe down spills and dirt; pressure washing can even be done in select installation applications\*.



#### Stylish

Matches what homeowners are currently doing inside the home.



#### Durable

High breakage loads of up to 1000 kg (2200 lbs) allows for breakage reduction.



#### Resistant

High compressive strength and ultra-low absorption rate creates a dense surface that resists mold, moss, dirt and other staining.



#### Skid-resistant

Structured paver top textures create non-slip surfaces for safety; perfect for around pools/spas or in wet climates.



# Modular Design

Superior accuracy in dimensional sizing and linear sides, the slabs allow for perfectly executed installations with tight and accurate lines.



## Light weight

17 kg (37 lbs) for the 60x60 cm (24"x24") paver permit for easy installation, removal and serviceability and even reusability (Excluding adhered installations).



Available in colors that have an SRI that qualifies for a LEED certification.

The SRI on some units ranges between 60-80%. To receive LEED credit, the SRI must be at least 29%.



## Impermeable

Deicing salt and other deicing materials can be used without concern of damage.

\* It is important that all pressure washing of your porcelain pavers be done with a low pressure washer with a maximum of 1600 psi and nothing more powerful. When pressure washing your installation, care should be taken to prevent damage to the grout (adhesive and grout installations) and some re-sanding will be necessary when power washing an installation with sand or polymeric sand joints.

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# PORCELAIN PAVERS INSTALLATION INFORMATION

#### SPECIALTY TOOLS FOR PORCELAIN PAVER CONSTRUCTION

- Wet cut tile saw equipped with a diamond blade manufactured for wet cutting porcelain. The saw should be designed to safely cut a 60 cm (24") length porcelain payer.
- A paver clamp for easy handling, which can be used to both install and remove pavers.
- The use of gloves is highly recommended while handling and installing porcelain slabs.
- Appropriate notched trowels and grout float tools for cementitious adhesive and grout Installation.
   The appropriate tool selection would be based on the adhesive and grout manufacturer's recommendations.



#### **HANDLING**

 Porcelain paver pallets are packaged with a very strong plastic covering and the individual units are packaged in protective cardboard boxes. The packaged pavers should not be removed from the protective boxes until they are ready for installation.

CAUTION: Removing pavers from their protective packaging and handling multiple loose stones together creates the possibility for chipping.

 Once the plastic shipping cover has been removed from the pallet, the un-used boxed pavers should be protected from the elements to insure the integrity of the protective cardboard boxes.



#### INSTALLATION INFORMATION

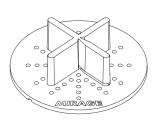
Each of the following option details will include specific information relative to the selected installation. Base thicknesses vary between different geographical and climatic locations and the contractor will be installing typical base thicknesses for paving installations in their location.

IMPORTANT: Installing porcelain pavers requires the bedding course sand to be pre-compacted and then struck off with a screed to the required thickness as shown in the detail drawings. The porcelain pavers are not compacted and therefore the sand layer beneath them requires pre-compaction. Do not compact dry sand, but insure the sand has a 5 to 6% moisture content so that it will compact cohesively and allow for a smooth strike off finish.

#### INSTALLATION INFORMATION THAT MUST BE FOLLOWED

- NEVER compact porcelain pavers with a plate compactor.
- ALWAYS pre-compact and strike off your sand leveling course before installing your porcelain pavers in sand set installations.
- Porcelain pavers should only be wet cut with a tile saw equipped with a wet cut porcelain blade.
- NEVER install porcelain pavers without the required 4 mm (3/16") spacing between them. The porcelain pavers should never be installed with a porcelain to porcelain contact. Plastic 4 mm (3/16") spacers (SPACE\_G shown in photos below) should be used on sand set and permeable installations. The photo on the left illustrates the spacer installed in a perspective to support and space 4 paver corners and the photo on the right illustrates the installed spacer snapped apart (as designed) to form a T-perspective that support 2 paver corners. This versatility will permit your porcelain pavers to be installed in a stack bond pattern, a running bond patterns as well as a flush installation against another structure.

SPACE\_G Mirage®







#### JOINT INFILLING INFORMATION

When porcelain pavers are installed as sand set installations, you may fill the 4 mm (3/16") paver joints with:

#### Traditional sand

Dry traditional sand is swept into the open joints until they are completely filled. Excess sand should be swept off of the pavement. Keep in mind that sand joint may in time have to be re-sanded as wind and rain can cause some erosion.

#### Cement blended sand

Dry cement blended sand (typical 3 parts sand to 1 part cement) is swept into the open joints until they are completely filled. Excess cement blended sand is swept off of the pavement. It is extremely important that all of the excess sand and dust be swept from the surface (blowers can be used for final dust removal), as any residual dust or sand can stain the surface. After joints are full and the surface is clean the pavement is misted with water to activate the cement and the curing of the mixture.

#### Polymeric sand

Polymeric sand is a manufactured sand that is blended with polymers which hardens when subjected to moisture. The sand is swept into the open joints until they are completely filled. Like cement blended sand, it is extremely important that all excess sand and dust be swept from the surface (blowers can be used for final dust removal), as any residual dust or sand can stain the surface. After joints are full and the surface is clean, the pavement is misted with water to activate the polymer and curing of the mixture.

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#### IMPORTANT NOTE:

- 1. When selecting sand for a traditional sand or cement blended sand infill, insure the gradation of the sand is fine enough to pass through and fill the 4 mm [7]1; joints.
- 2. When using Polymeric Sand it is important to follow the manufacturer's instructions to insure there is no surface staining.
- 3. Cement blended sand and polymeric sand can both contribute to a reduction in joint plant growth and insect infiltration within the joint infill material.

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#### IMPORTANT NOTE: LEGAL DISCLAIMER

The nominal measurements include 4mm for product spacers which are sold separately. Although extreme care has been taken to ensure the accuracy of all measurements set forth herein, Manufacturer assumes no liability relating thereto.

# PORCELAIN PAVERS INSTALLATION INFORMATION

# INSTALLATION **OPTIONS**

#### **INSTALLATION OPTIONS**

1. Sand Set over Compacted Road Base Installation	(Pedestrian Traffic)
2. Sand Set over Concrete Overlay Installation	(Pedestrian Traffic)
3. Cementitious Adhesive Overlay, Concrete Base Installation	(Light Vehicular Traffic)
4. Permeable Over Open Graded Aggregate Installation	(Pedestrian Traffic)
5. Stepping Stone Sand Set on Compacted Road Base Installation	(Pedestrian Traffic)
6. 20 mm [¾"] Fixed Pedestal Installation on Concrete Floor	(Pedestrian Traffic)

Roof Top and Commercial Raised Pedestal Installations require engineered design. For Engineered support and other additional technical information on the installation of porcelain pavers, please contact Mirage® at info@mirage.it.



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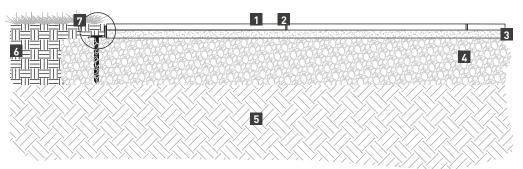
### 1. SAND SET OVER COMPACTED ROAD BASE INSTALLATION

(PEDESTRIAN FOOT TRAFFIC)

#### **INSTALLATION NOTES:**

Follow the detail drawing below.

- Base material is to be over based 15 to 20 cm (6" to 8") beyond the edge of the pavement.
- The required edge restraint system is a low profile edge restraint with a vertical height of 4 cm (1½") as shown in the drawing.
- Insure that pavement is constructed with a 1,5 to 2 degree slope that it is pitched away from any building.
- Insure the plastic 4 mm (3/16) spacers are installed at all corners of the installed pavers.



- 1. Mirage® Porcelain 20 mm (¾" nominal) pavers.
- **2.** Minimum 4 mm  $(^{8}/_{16}")$  spacing between pavers.
- 3. Sand bedding course [2,5 cm 1" Pre-compacted thickness] NOTE: Pre-compact the sand bedding course and screed to a 2,5 cm [1"] thickness with smooth surface.
- 4. Compacted road base

 $2\ cm\ (\%")$  minus road base material. Base thickness is determined by soil and climatic conditions.

- 5. Subgrade
- 6. Soil



- 7. Peripheral Restraint System Spiked into 15 to 20 cm (6" to 8") over base area.
- 20 mm (¾") Mirage® Porcelain Paver
- 2,5 cm (1") Pre-compacted torpedo sand
- 4 cm (1½") tall peripheral restraint system spiked into 15 to 20 cm (6" to 8") over base area



IMPORTAN

For a professional and chip free cut, Mirage® Porcelain Pavers should only be cut with a tile saw equipped with a wet cut porcelain blade.

#### CAUTION:

Never compact Mirage® Porcelain Pavers with a plate compactor.

Never install Mirage® Porcelain Pavers without the required 4 mm (3/16") spacers between all units.

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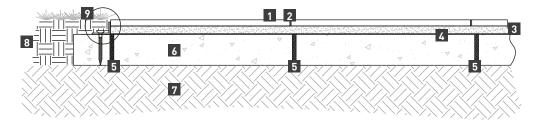
#### 2. SAND SET OVER CONCRETE OVERLAY INSTALLATION

(PEDESTRIAN FOOT TRAFFIC)

#### **INSTALLATION NOTES:**

Follow the detail drawing below.

- The required edge restraint system is a low profile edge restraint with a vertical height of 4 cm (1½") as shown in the drawing.
- Mechanically anchor edge restraint into the concrete base.
- Insure geotextile is installed directly on top of the concrete to contain the bedding sand.
- Insure that pavement is constructed with a 1,5 to 2 degree slope and that it is pitched away from any building.
- Insure the plastic 4 mm (3/16) spacers are installed at all corners of the installed pavers.



- 1. Mirage® Porcelain 20 mm (¾" nominal) pavers.
- **2.** Minimum 4 mm  $\binom{3}{16}$ ") spacing between pavers.
- 3. Sand bedding course (2,5 cm 1" Pre-compacted thickness)
  NOTE: Pre-compact the sand bedding course and screed to a 2,5 cm
  [1"] thickness with smooth surface.

#### 4. Geotextile fabric

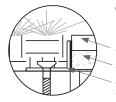
Installed on top of concrete and folden up the front of the Edging. This is required to prevent the unwanted migration of the sand bedding course material.

**5.** 12,5 mm (½") drainage holes drilled 60 cm (24") on center.

#### 6. Concrete base

**NOTE:** A concrete base with a sound surface and small cracks can be utilized as a base for paving slab construction, but a concrete base with differential settlement or movement is not acceptable.

- 7. Subgrade
- 8. Soil



**9.** Peripheral Restraint System Mechanical fastened into concrete base.

20 mm (¾") Mirage® Porcelain Paver 2,5 cm (1") Pre-compacted torpedo sand 4 cm (1½") tall peripheral restraint system anchored into concrete base.

# IMPORTANT:

For a professional and chip free cut, Mirage® Porcelain Pavers should only be cut with a tile saw equipped with a wet cut porcelain blade.

#### CALITION

Never compact Mirage® Porcelain Pavers with a plate compactor.

Never install Mirage® Porcelain Pavers without the required 4 mm [9/16] spacers between all units.

# 3. CEMENTITIOUS ADHESIVE OVERLAY, CONCRETE BASE INSTALLATION [I IGHT VEHICLE TRAFFIC]

#### INSTALLATION NOTES:

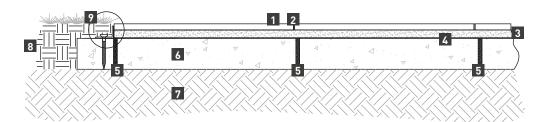
Follow the detail drawing below.

- Insure that pavement is constructed with a 2 degree pitch and that it is pitched away from any building.
- Referenced approved cementitious adhesive.
   www.mapei.com/public/US/products/Kerabond\_T-Keralastic\_EN\_lr.pdf
   www.mapei.com/public/US/products/Ultraflex LFT EN lr.pdf
- Referenced approved joint grout products.
   www.mapei.com/public/US/products/ultracolorplus\_tds\_ea.pdf,
   www.mapei.com/public/US/products/kerapoxytds\_ea.pdf

For cementitious adhesive and grout installation, refer to the manufacturer's technical instructions and specifically as they relate to outdoor installations.

• For concrete foundation slabs that are not large enough to require contraction / control joints, a minimum 4 mm [1/8" to 3/16"] grout joint is acceptable, but for larger concrete foundation slabs that do require contraction / control joints, the joint width should be a 1 cm [3/8"]. It is absolutely imperative that all contraction / control joints be located in the joint line of installed porcelain pavers and not beneath a paver.

CAUTION: If a Porcelain Paver is installed over a control joint, the paver will reflectively crack along the contraction / control joint beneath it.



- 1. Mirage® Porcelain 20 mm (¾" nominal) pavers
- **2.** Minimum 4 mm  $(^{9}/_{16})^{-1}$  spacing between pavers.
- 3. Sand bedding course (2,5 cm 1" Pre-compacted thickness)
  NOTE: Pre-compact the sand bedding course and screed to a 2,5 cm
  [1"] thickness with smooth surface.

#### 4. Geotextile fabric

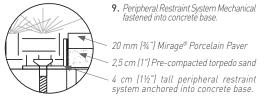
Installed on top of concrete and folden up the front of the Edging. This is required to prevent the unwanted migration of the sand bedding course material.

**5.** 12,5 mm (½") drainage holes drilled 60 cm (24") on center.

#### 6. Concrete base

NOTE: A concrete base with a sound surface and small cracks can be utilized as a base for paving slab construction, but a concrete base with differential settlement or movement is not acceptable.

- 7. Subgrade
- 8. Soil



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#### IMPORTANT:

For a professional and chip free cut, Mirage® Porcelain Pavers should only be cut with a tile saw equipped with a wet cut porcelain blade.

#### CALITION.

Never compact Mirage® Porcelain Pavers with a plate compactor. Never install Mirage® Porcelain Pavers without the required 4 mm [³/16"] spacers between all units.

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# 4. PERMEABLE OVER OPEN GRADED AGGREGATE INSTALLATION

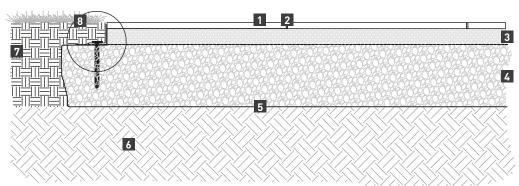
(PEDESTRIAN FOOT TRAFFIC)

#### INSTALLATION NOTES:

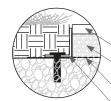
Follow the detail drawing below.

- The required edge restraint system for this installation has a vertical height of 6 cm (2½") as shown in the drawing. Follow the edge restraint manufacturer's recommendations for the use of their product in permeable applications regarding geogrid usage and placement to maintain the performance of there edging.
- Insure that pavement is constructed with a 2 degree pitch and that it is pitched away from any building.
- Insure the 4 mm  $(\frac{3}{16})$  spacers are installed between all pavers.

#### **FULL INFILTRATION - PERMEABLE SUBGRADE**



- 1. Mirage® Porcelain 20 mm (¾" nominal) pavers.
- **2.** Minimum 4 mm  $\binom{3}{16}$ ") spacing between pavers.
- **3.** 5 cm (2") bedding course of 1 cm (8/8") open graded aggregate. **NOTE:** Pre-compact the sand bedding course and screed to a 2,5 cm [1"] thickness with smooth surface.
- **4.** Compacted base course of 20 mm (¾") open graded aggregate. Final Base Course thickness and exfiltration design is determined by soil, climatic and hydraulic considerations.
- 5. Geotextile
- 6. Subgrade
- 7. Soil



8. Peripheral Restraint System Spiked into 15 to 20 cm (6" to 8") over base area.

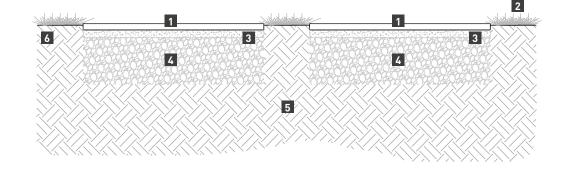
20 mm (¾") Mirage® Porcelain Paver

5 cm (2") Pre-compacted 1 cm ( $^{3}/_{8}$ ") open graded aggregate

Geogrid to stabilize the restraint system

6 cm (2½") tall peripheral restraint system spiked into 15 to 20 cm (6" to 8") over base area

# **5. STEPPING STONE SAND SET ON COMPACTED ROAD BASE INSTALLATION**[PEDESTRIAN FOOT TRAFFIC]



- 1. Mirage® Porcelain 20 mm (¾" nominal) pavers.
- 2. Grass cutout areas provide peripheral paver containment.
- 3. Sand Bedding Course (2,5 cm 1" Pre-compacted thickness).

  NOTE: Pre-compact the sand bedding course and screed to a 2,5 cm

  [1"] thickness with smooth surface.
- 4. Compacted road base.

Compacted Road Base, 2 cm (%") minus road base material. Base thickness is determied by soil and climatic conditions.

- 5. Subgrade
- 6. Soil

# i IMPORTA

For a professional and chip free cut, Mirage® Porcelain Pavers should only be cut with a tile saw equipped with a wet cut porcelain blade.

Never compact Mirage® Porcelain Pavers with a plate compactor.

Never install Mirage® Porcelain Pavers without the required 4 mm (3/16") spacers between all units.

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#### **IMPORTANT**

For a professional and chip free cut, Mirage® Porcelain Pavers should only be cut with a tile saw equipped with a wet cut porcelain blade.

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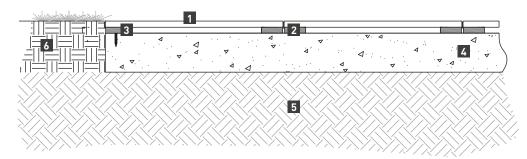
# INSTALLATION OPTIONS

# **6. 20 MM (¾") FIXED PEDESTAL INSTALLATION ON CONCRETE FLOOR** (PEDESTRIAN FOOT TRAFFIC)

#### **INSTALLATION NOTES:**

Follow the detail drawing below.

- Insure that concrete slab is smooth, even across the surface and is constructed with a 2 degree pitch and that it is pitched away from any building.
- Insure the plastic 20 mm (¾") pedestal support are installed at all corners of the installed pavers.



- 1. Mirage® Porcelain 20 mm (¾" nominal) pavers.
- 2. 20 mm (¾") Pedestal for raised installation (sectionable). Pedestal must have a rubber coverage on top, in order to prevent any breakage slab.







- 3. Sectioned pedestal anchored or adhesively bonded to concrete base.
- 4. Concrete base.

Thickness and reinforcement requirements are based on traffic loading and are to be designed and constructed according to the proper local standards.

- 5. Subgrade
- 6. Soil



#### MPORTANT:

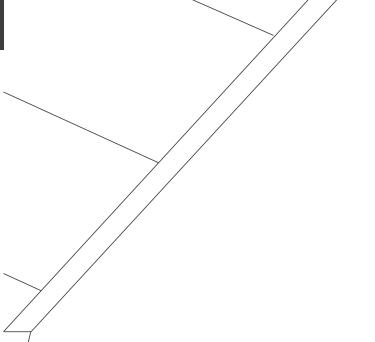
 $For a professional \ and \ chip \ free \ cut, \ Mirage ^{@} \ Porcelain \ Pavers \ should \ only \ be \ cut \ with \ a \ tile \ saw \ equipped \ with \ a \ wet \ cut \ porcelain \ blade.$ 

#### CAUTION:

Never compact Mirage® Porcelain Pavers with a plate compactor.

Never install Mirage® Porcelain Pavers without the required 4 mm (3/16") spacers between all units.

For installation above 2 cm (3/4") please contact Mirage®.



#### **CONTEMPORARY LANDSCAPE**

In 2010 Mirage® made its mark as the first international company to develop a complete range of 20 mm (¾") porcelain stoneware for outdoor flooring and furnishing. A system that brings innovation to the Contemporary Landscape Design world. Today EVO\_2/E<sup>TM</sup> is still the most advanced range on the market, thanks to the know-how acquired in years of research and the wide range of colours, sizes, special pieces and complements.

#### **WARNING**

- OUTDOOR PAYINGS INSTALLED UNGLUED ABOVE THE GROUND LEVEL ARE SUBJECT TO THE ACTION OF THE WIND, WITH THE RISK,
  IN SOME CASES, OF BECOMING AIRBORNE. THE MANUFACTURER RECOMMENDS TO REQUIRE THE ASSISTANCE OF A QUALIFIED
  PROFESSIONAL IN ORDER TO CHECK THE SUITABILITY OF THE INSTALLATION SYSTEM ABOVE THE GROUND ADOPTED, IN ACCORDANCE
  WITH THE LOCAL LAWS AND REGULATIONS AND THE CONDITIONS OF USE. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY OR
  PROPERTY DAMAGE.
- A CERAMIC SLAB INSTALLED ON A RAISED PEDESTAL SYSTEM MAY FRACTURE ON IMPACT IF A HEAVY OBJECT IS DROPPED ONTO IT FROM
  A HEIGHT, WITH A RISK OF INJURY TO ANYONE STANDING OR WALKING ON SUCH SLAB. FAILURE TO ADHERE TO THE MANUFACTURER'S
  INSTRUCTIONS FOR INSTALLATION OF SLABS ON RAISED PEDESTAL SYSTEMS MAY RESULT IN SERIOUS INJURY.

FOR FURTHER INFORMATION AND RECOMMENDATIONS CONCERNING THE INSTALLATION SYSTEMS PLEASE REFER TO **WWW.MIRAGE.IT** OR TO THE **EVO\_2/E™ 20 MM. CATALOGUE.** 

#### NOTE

IF THE APPLICATION OF THE 20 MM (%") SLABS FORESEES THE CERAMIC PRODUCT USED IN STRUCTURAL INSTALLATIONS, THE PROJECT ENGINEER AND/OR CUSTOMER MUST CAREFULLY ASSESS THE PROJECT REQUIREMENTS WITH REGARD TO THE TECHNICALSPECIFICATIONS OF THE SLABS.

TO PREVENT THE RISK OF DAMAGE OR INJURY, THE MANUFACTURER RECOMMENDS:

- WITH REGARD TO A RAISED FLOOR INSTALLATION A CERAMIC SLAB MAY FRACTURE ON IMPACT IF A HEAVY OBJECT FALLS ON IT FROM
  ANY SIGNIFICANT HEIGHT. THEREFORE THE MANUFACTURER RECOMMENDS TO CHECK THE SPECIFIC INTENDED USE BEFORE STARTING
  THE INSTALLATION AND TO FOLLOW TABLE FOR RAISED INSTALLATION PROVIDED BELOW. IN CERTAIN CONDITIONS, REINFORCING MUST
  BE APPLIED ON THE BACK OF THE SLABS IMESH PLUS OR GALVANIZED STEEL SHEETI SUPPLIED AND APPLIED BY THE MANUFACTURER.
- WITH REFERENCE TO ANY DRY INSTALLATION SYSTEM OF FLOORING ABOVE THE GROUND LEVEL, THE MANUFACTURER RECOMMENDS
  TO COMPLY WITH LOCAL REGULATIONS AND CONDITIONS OF USE WITH REGARD TO WIND-LOAD, LOADBEARING, SEISMIC EVENTS, ETC.

FAILURE TO COMPLY WITH THESE RECOMMENDATIONS MAY LEAD TO IMPROPER USE OF THE PRODUCT AND COULD CAUSE SERIOUS DAMAGE OR INJURY.



#### MIRAGE® USA

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# www.mirage.it









