PORCELAIN PAVERS

POPA 2.0

An italian porcelain paver made in USA




RE-QUALIFY
SYSTEM

KRONOS
USA

TEX BROWN 60x60 - 23 ½"x 23 ½" RECTIFIED

INDEX

KRONOS USA

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RE-QUALIFY SYSTEM

Re-Qualify System is Kronos innovative approach to Green and Eco-Sustainability.
Re-Qualify System is Kronos new philosophy, approach and mission, to minimize the environmental impact in remodeling as well as new construction projects by:

- reducing or fully eliminating the use of adhesives and setting materials;
- reducing or fully eliminating the use of water;
- reducing or fully eliminating any waste resulting from the production cycle.

All the above for a more environmentally friendly production cycle and the consequent significant results of both energy and economic savings.

TEX BROWN 60x60 23 ½"x 23 ½" RECTIFIED

KRONOS GREEN APPROACH

CO2 REDUCTION
In the last 10 years Kronos has reduced its CO2 emissions by no less than 17%.New investments for a further reduction are planned, using techniques for reutilizing heat generated during the production process and creating energy by cogeneration.

GREEN ENERGY
Kronos uses Green Energy. All electricity used at the Kronos plants is obtained from cogeneration and hydroelectric power station.

RECYCLING PROCESS: ZERO WASTE
Kronos tiles are produced following a specific process that allows the addition of recycle content to the layer body of the tiles. This makes possible for Kronos to use pre-and-post consumer waste to create a body layer and thus a tile of high quality.
Kronos tiles and slabs, consist of 35% recycled material, depending on the product.
The pre-consumer recycling system is 100%.
Post-consumer recycling is under study and some preliminary trials should start shortly.

LOCAL RAW MATERIALS
Kronos sources most of its natural raw materials for tile production in America 100%.
All the raw materials come from a radius of 800 Km/ 500 Ml.

H20 MANAGEMENT AND PURIFICATION
All waste-water is reused through the manufacturing process, this is already 100%.

RECYCLED/RECYCLABLE PACKING MATERIAL
All our paper packaging materials are made from recycled paper and are further recyclable.
Kronos uses “Heat treatment certified pallets” that are disinfected by heat and not by poisonous gas.

LIFE CYCLE ASSESSMENT
A life Cycle Assessment (LCA) is also known as an “eco-balance” or cradle-to-grave-analysis.
It is the investigation and evaluation of the environmental impact of a given product or service caused or necessitated by its existence.
Kronos tiles and slabs have a very long life cycle.
Technically, Kronos tiles and slabs may be used for many hundreds of years without losing their looks or their technical quality. Innovation and design plays a major role at Kronos.
Kronos has developped specif systems to install its Porcelain Pavers without cement, glues, mortar or setting materials both on floors and walls. It is no longer necessary to grout the joint line between Kronos Porcelain Pavers, our products can be installed “DRY”.
The elimination of setting materials allows significant savings in terms of cost and time of transportation and installation.
The job sites are immediately available after Kronos Porcelain Pavers are dry installed while the use of traditional setting materials makes necessary to let the installation cure and dry. Kronos Porcelain Pavers dry installation also significantly reduces the creation of dusts and pollutants.
In fact the users of spaces created with Kronos Porcelain Pavers will be less prone to allergies and respiratory problems that may be caused by breathing residual dusts and moisture caused by traditional settings methods.

WHY CHOOSE POPA 2.0?

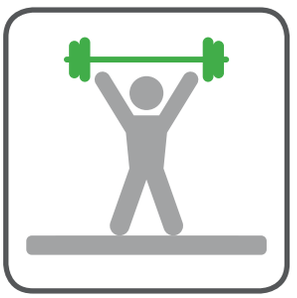
HC
HEAVY COMMERCIAL

NEW SOLUTION IN EXTRA-THICK PORCELAIN STONEWARE FOR OUTDOOR TRILLING. 2 CM THICK, COLORED FINE PORCELAIN STONEWARE SLABS OBTAINED FROM ATOMIZING HIGH-CLASS CLAYS, QUARTZES AND METAL OXIDES PRESSED AT 400 KG/CM², COMPLETELY SINTERED AT A TEMPERATURE OF 1200°C AND THEN SQUARED USING A SYSTEM OF ABRASIVE GRINDERS.

THERMAL SHOCK RESISTANT. (-40°F - 210°F)

SUPERIOR IN FIRE RESISTANCE AND DURABILITY TO WOOD TILES

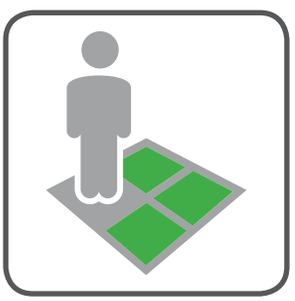
EASY TO CLEAN STAIN, CHEMICAL AND SALT RESISTANT



SUPERIOR IN STRENGTH AND IMPACT RESISTANCE TO CERAMIC TILES (SUPPORTS OVER 2000LB), LIGHTER AND EASIER TO HANDLE THAN CONCRETE BLOCKS

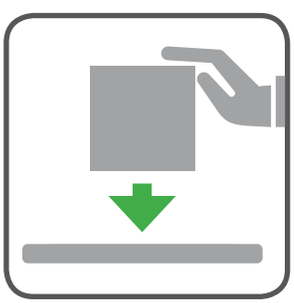
VIRTUALLY NO MAINTENANCE

SLIP RESISTANT AND QUICK DRAINING

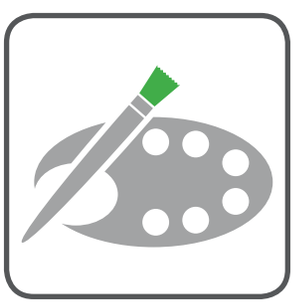


EASY TO INSTALL

REMOVABLE AND REUSABLE
POPA 2.0 is ideal both for temporary flooring and for permanent flooring

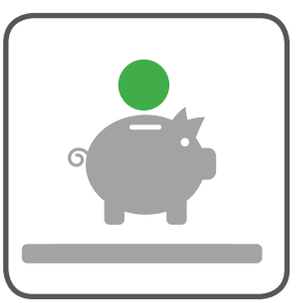


VERSATILE INSTALLATION
Varius installation methods including pedestal set, gravel and grass set.
They offer endless opportunities for landscape design creativity in both domestic and commercial applications.



FADE RESISTANT

AVAILABLE IN A BROAD RANGE OF COLORS/STYLES



MASSIVE OVER LIFE COST SAVINGS
more cost effective than grating or grid structures for elevated paving installations

LEED CREDITS

Environment PRIORITY ONE

Kronos Porcelain Pavers are produced in the U.S. manufacturing plans located in Tennessee, member of the U.S. Green Building Council: this is an organization which promotes buildings that are environmentally responsible, profitable and healthy places to live and work.

RECYCLED CONTENT, MR Credit 4.1 and 4.2 (2 LEED points)
Kronos USA.inc products are produced with 35% of pre-consumer recycled materials.

REGIONAL MATERIALS, MR Credit 5.2 (2 LEED points are granted if the use of local raw material is equal to 20% of the total value of the raw materials)

These Credits are applicable for buildings constructed within 500 miles (804,5 km) from Kronos USA.inc.
49% of whole Kronos USA.inc raw materials are quarried in the 500 miles radius. Therefore Kronos USA.inc products contribute for 49% of their value to the LEED Credits of this Section.

HEAT ISLAND EFFECT (Non roof), SS Credit 7.1 (1 LEED point)
The great majority of Kronos USA inc. products do not contribute to change the energy balance of the environments where installed. They do not produce any Urban Heat Island Effect, thanks to its very good physical properties Solar Reflectance Index SRI ≥ 29.

LOW EMITTING MATERIALS, EQ Credit 4.2 (1 LEED point)
No traces of VOC (Volatile Organic Compounds) are present in Kronos USA.inc tiles (as certified by the external labs in charge of the tests).

INNOVATION IN DESIGN, ID Credit 1.1-1.4 (1-4 LEED points)

Kronos USA.inc tiles are produced in manufacturing plans which have got the prestigious ecological mark ECOLABEL (EU Regulation 2002/272/EC).
These plants vant the environmental management systems compliant to ISO 14001:2004 and EMAS (European Council Regulation 761/2001).

These environmental standards guarantee excellence in terms of:
- safeguard of the environment;
- continuous improvement of the environmental performances of Kronos USA.inc products and manufacturing sites;
- healthcare of Kronos Usa.inc workers and customers.

VERSATILE INSTALLATION

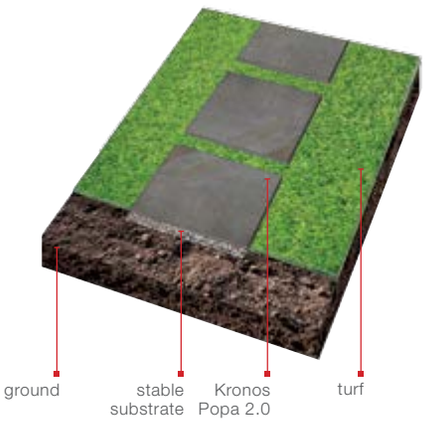
LAY ON GRASS, ZEN GARDEN

Lay on grass is quick and easy. It consists in laying the stoneware slabs on the turf or placing them in the topsoil to make them more stable.

PLUS

- EASY TO INSTALL AND REMOVE
- QUICK WATER DRAINAGE KEEPING THE GROUND UNCHANGED
- IDEAL TO CREATE CONTINUITY BETWEEN INDOOR AND OUTDOOR FLOORING
- INTENDED USE:

GARDEN PATHS
BARBECUE AREAS
GAZEBOS
WALKWAYS
BEACH RESORTS
EXHIBITIONS AND EVENTS



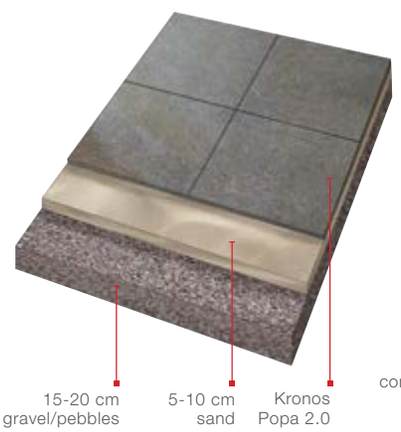
DRY-INSTALLATION ONTO SOFT GROUND

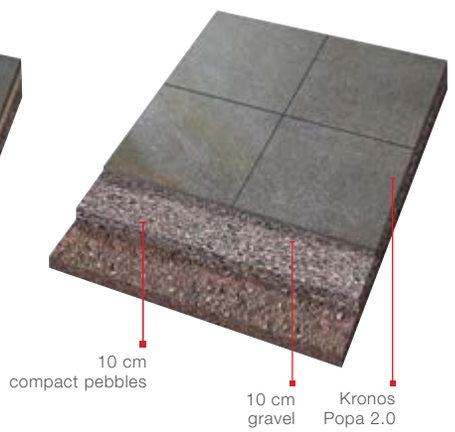
Soft ground is intended to mean surfaces that have never been paved, such as gardens, courtyards, sandy areas, etc...

PLUS

- EASY TO INSTALL AND REMOVE
- QUICK WATER DRAINAGE KEEPING THE GROUND UNCHANGED
- IDEAL WHERE IT IS NOT POSSIBLE TO LAY PERMANENT FLOORING
- INTENDED USE:

GARDEN PATHS
BARBECUE AREAS
GAZEBOS
WALKWAYS
BEACH RESORTS
EXHIBITIONS AND EVENTS





ADHESIVE INSTALLATION

DRAINING SCREED

It is ideal for garden and courtyard flooring because it ensures that water is drained correctly, using the special glues.

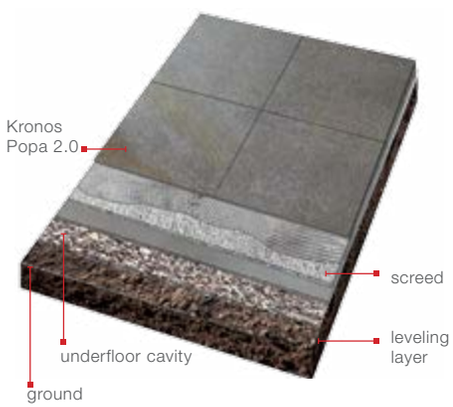
VEHICLE TRANSIT PAVEMENT

It is ideal for parking lots and garage ramps, thanks to the extremely high resistance of ceramic surface to dynamic and concentrate loads.

PLUS

- HIGH RESISTANCE TO DYNAMIC AND CONCENTRATE LOADS
- IDEAL TO CREATE CONTINUITY BETWEEN ON FOOT AREAS AND BY CAR AREAS, USING THE SAME MATERIAL

DRAINING SCREED



DRIVE FLOOR

RAISED FLOOR

A solution for every need

Ⓐ RAISED FLOOR WITH FIXED HEIGHT PEDESTAL
The simplest solution for a floor raised 12mm (inch?) above the existing surface.

Ⓑ RAISED FLOOR WITH ADJUSTABLE STAR.T PEDESTAL, STAR.B PEDESTAL, SE PEDESTAL, NM PEDESTAL
Self-leveling pedestals: they automatically justify slopes to 5%.
Height-adjustable pedestals: the height can be adjusted using the appropriate reinforced adjustment key, even after at the end of the installation.

PLUS

- FROM THE AESTHETIC POINT OF VIEW, IT ENSURES FLOORING WITH A SINGLE GRADIENT, WITHOUT ANY VISIBLE WATER DRAINING ELEMENTS
- THE SMALL GAP BETWEEN ONE SLAB AND ANOTHER ALLOWS A QUICK WATER DRAINAGE, IT IS EASY TO CLEAN
- LOWER LOAD BEARING ON ATTICS AND BALCONIES AS THE LAST LAYER OF CONCRETE AND GLUE IS NOT NECESSARY
- FROST-PROOF, IT ABSORBS THE THERMAL EXPANSIONS OF THE CONCRETE SUBSTRATE, THE DIRECT CAUSE OF TRADITIONAL OUTDOOR FLOORING SUBSIDENCES
- THE GAP BETWEEN THE SLAB AND THE CONCRETE SUBSTRATE FOSTERS EXCELLENT THERMAL INSULATION
- BEST ACOUSTIC INSULATION
- HIDDEN BUT EASY TO INSPECT PIPES
- SPEED OF INSTALLATION
- RICYCLABLE
- VALUE FOR MONEY SOLUTION IN TERMS OF LAYING AND MAINTENANCE, LASTS VIRTUALLY FOREVER

Ⓐ

Ⓑ

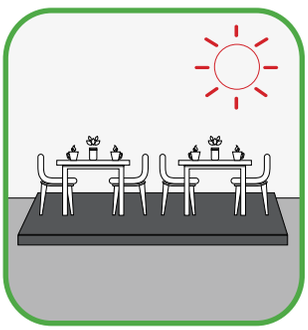
INTENDED USES

Popa 2.0 is a product with high aesthetic and technical characteristics, adaptable and functional for any outdoor enviroment.

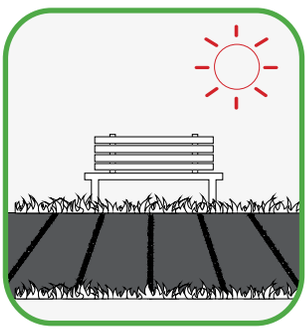
COMMERCIAL AREAS:
Dehors, swimming-pools, beach resorts, walkways, pathways, events and exhibitions, parking lots, etc…

RESIDENCIAL AREAS:
Patios, terraces, gazebos, swimming-pools, garden paths, stairs, attics, car parks, etc…

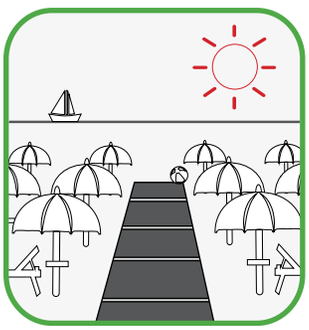
COMMERCIAL AREAS



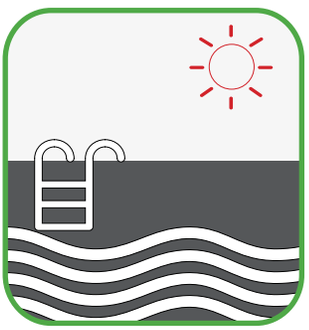
Sidewalks, cafes



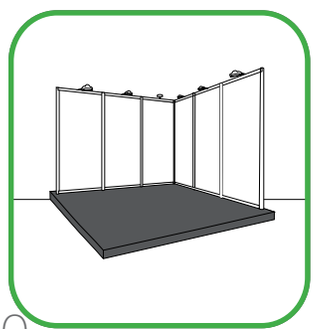
Walkways and pathways



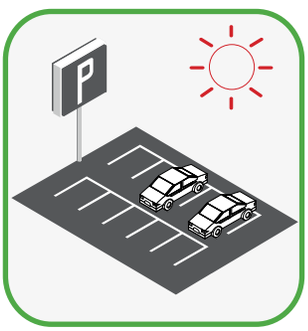
Beach resorts



Swimming-pools

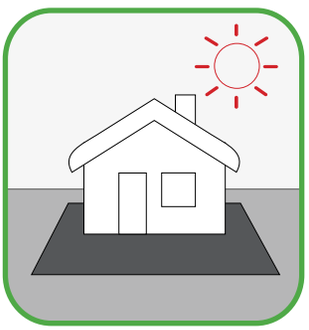


Exhibitions and events

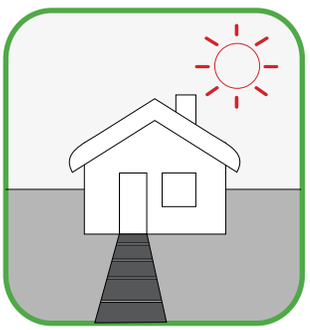


Pubblic parks

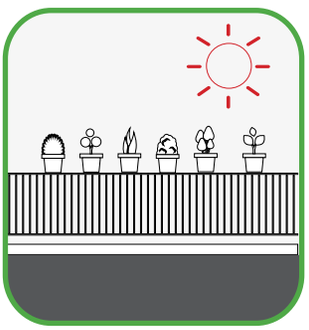
RESIDENTIAL AREAS



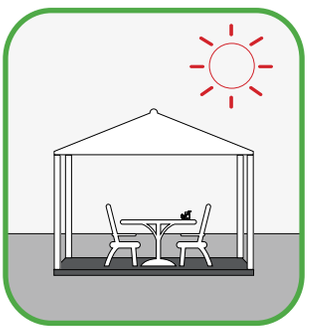
Gardens and patios



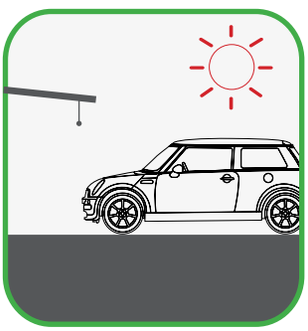
Garden paths



Terraces and balconies



Gazebos



Public parkings

OCEAN STONE BLACK 60x60 - 23 ½"x 23 ½" RECTIFIED

TEX GREY 60x60 - 23 ½"x 23 ½" RECTIFIED

POPA 2.0 60x60 - 23½"x 23½" RECTIFIED

STONE

US7903 MOONSTONE

US7904 CREAMSTONE

TEX WOOD

US7900 GREY

US7901 BROWN

US7902 IVORY

TIMBER WOOD

US7905 TEAK

US7906 IPE’

POPA 2.0 60x60 - 23½"x 23½" RECTIFIED

ICON TRAVERTINE

US7908 PEARL

US7909 RIVER

QUARZITE

US7907 CRYSTAL WHITE

US7910 SANDY ISLAND

OCEAN STONE

US7911 WHITE COOL

US7912 BLACK

US7913 TAN

MOONSTONE US7903

60x60 - 23½"x 23½" RECTIFIED

CREAMSTONE US7904

60x60 - 23½"x 23½" RECTIFIED

TEX GREY US7900

60x60 - 23½"x 23½" RECTIFIED

TEX BROWN US7901

60x60 - 23½"x 23½" RECTIFIED

TEX IVORY US7902

60x60 - 23½"x 23½" RECTIFIED

TIMBER TEAK US7905

60x60 - 23½"x 23½" RECTIFIED

TIMBER IPE US7906

60x60 - 23½"x 23½" RECTIFIED

ICON TRAVERTINE PEARL US7908

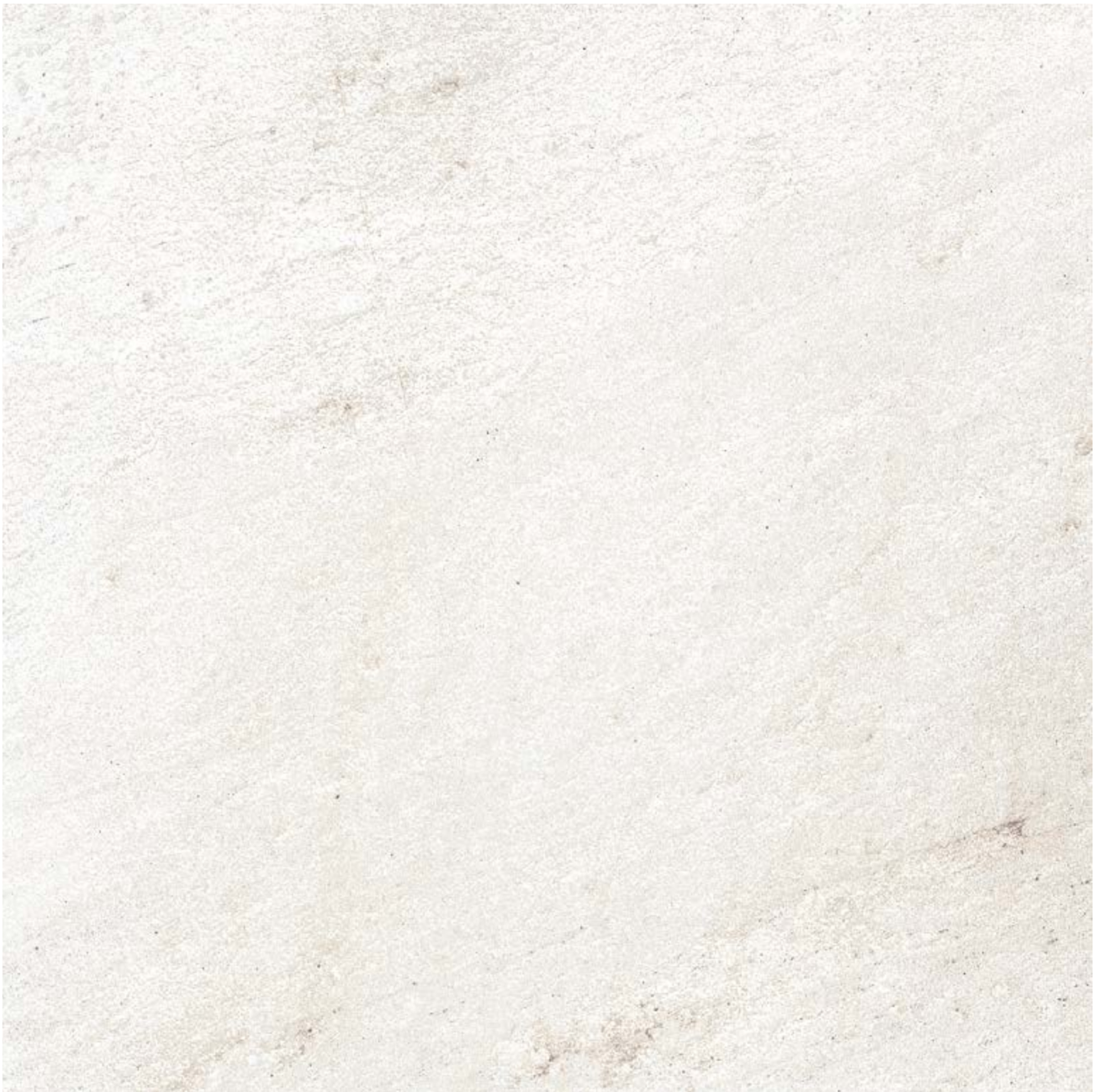
60x60 - 23½"x 23½" RECTIFIED

ICON TRAVERTINE RIVER US7909

60x60 - 23½"x 23½" RECTIFIED

CRYSTAL WHITE US7907

60x60 - 23½"x 23½" RECTIFIED



SANDY ISLAND US7910

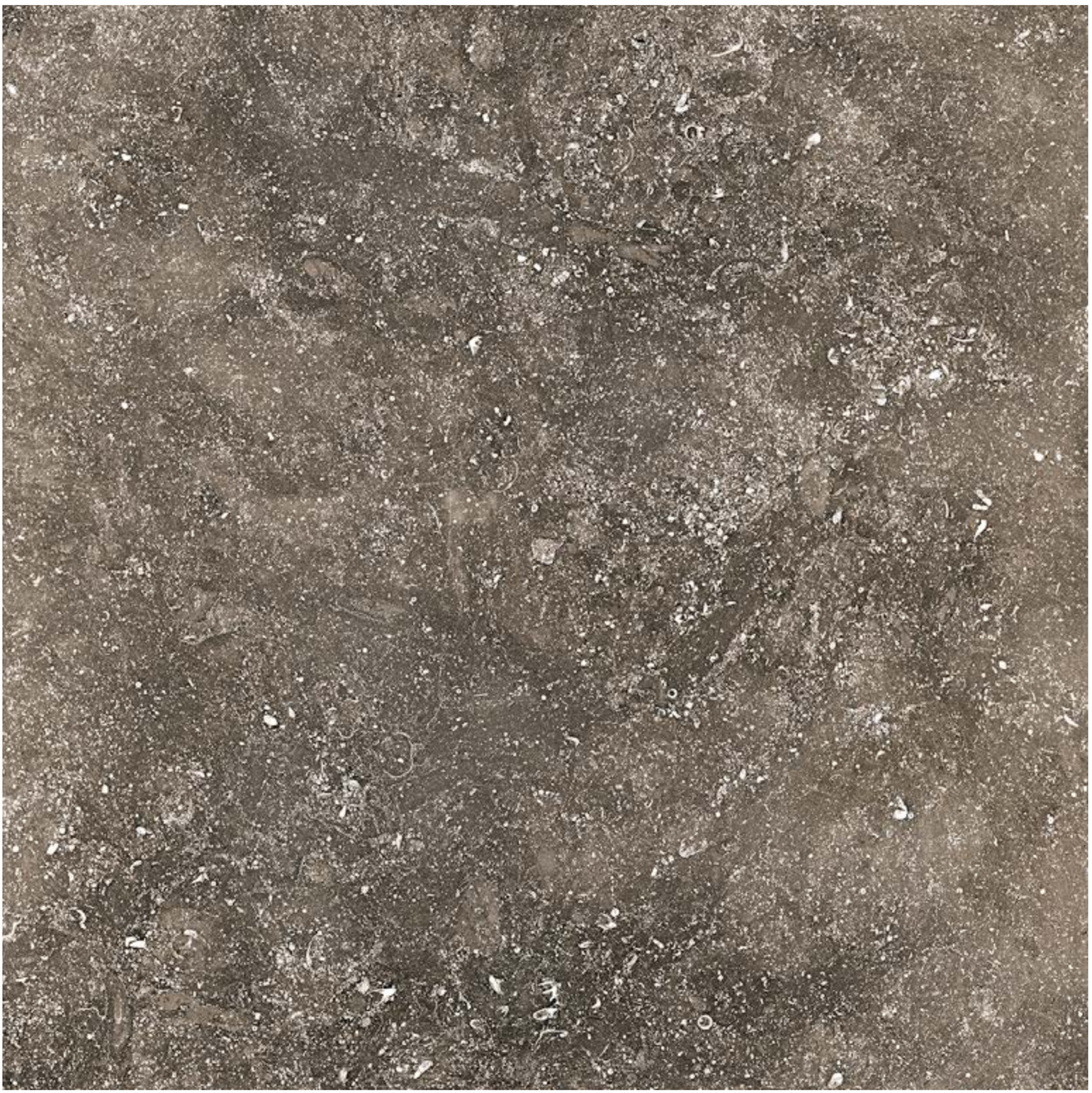
60x60 - 23½"x 23½" RECTIFIED

WHITE COOL US7911

60x60 - 23½"x 23½" RECTIFIED

BLACK US7912

60x60 - 23½"x 23½" RECTIFIED



OCEAN STONE TAN US7913

60x60 - 23½"x 23½" RECTIFIED

laying instructions
CONSEILS POUR LA POSE

Laying 2 cm - 3/4" slabs outdoors

Due to the size and nature of porcelain stoneware slabs and their pronounced anti-slip surface (which always retain a thin layer of water), special attention should be given to the slope and inclination of the substrate and the direction laying of the pavers. The slope of the floor must meet both the architectural specifications of the project and the requirement for natural drainage of rainwater. These conditions will vary according to the geographical region, orientation and exposure to prevailing weather, whether it is completely bare etc. By way of example, the Swiss office UPI, recommends (non-binding) slopes of not less than 1.5% per linear meter.

Pose 2 cm - 3/4" en extérieur

Étant donné les dimensions et la nature des dalles en grès cérame, la forme prononcée du relief antiglisse (qui retient toujours un voile d'eau), une attention particulière doit être prêtée au pourcentage de pente et d'inclinaison que le client veut donner au plan du revêtement ainsi que le sens de pose de la dalle en grés. Le % d'inclinaison et de pente du revêtement doit satisfaire les choix architecturaux du projet et les besoins naturels d'écoulement des eaux de pluie. Celles-ci varient selon la zone géographique, l'orientation et l'exposition de la zone concernée.
À titre d'exemple et non contraignant, le bureau de prévention des accidents de travail suisse conseille des déclivités non inférieures à 1,5 % par mètre linéaire.

Cutting

To cut 2 cm - 3/4" product take the necessary measurements and mark the part to be removed on the slab. Then cut with angle grinder or water-cooled cutter.

Coupe

Pour couper 2 cm - 3/4", prévoir les mesures nécessaires et marquer la partie à enlever directement sur la dalle. Couper ensuite au à la meuleuse avec un coupe-carreau.

POPA 2.0 pre-jointed staves

Due to their particular structure (bas-relief groove) which reproduces a wood grooves effect, the sizes of the outer slats of each piece may be slightly different from that of the inner slats. This is due to the production calibre which may have significant variations in size from one production batch to another. Unfortunately this variation only concerns the outer slats.
For this reason these products must have a minimum aesthetic tolerance which can be improved by taking the following countermeasures:

1. Use pedestals with cross spacers of at least 4 mm in order to have the same size for the joint (POPA 2.0).
During traditional installation always use 4 mm cross spacers (which basically means reproducing the same size of inner slats in the part).

2. Always lay the material in the same direction the same direction as in production (which can be checked from the pad).

3. Adopt the basket weave layout.

Lattes prealablement jointees POPA 2.0

Étant donnée la structure particulière (bas-relief pré-incisé) qui reproduit un effet lattes pré-jointées, les dimensions des lattes extérieures de chaque pièce peuvent avoir des différences minimes par rapport aux lattes intérieures. Ceci est dû au calibre de production qui peut avoir des variations dimensionnelles importantes à chaque production. Malheureusement, cette variation influence seulement les lattes extérieures.
C'est la raison pour laquelle les produits en objet doivent avoir des tolérances esthétiques minimales et, pour les améliorer, nous pouvons conseiller les contre-mesures suivantes :

1. Utiliser des pieds avec croisillons d'au moins 4 mm de manière à avoir la même dimension pour le joint. (POPA 2.0)
Pour la pose traditionnelle, utiliser toujours des croisillons de 4 mm (il s'agit en fait de répéter le même dimensionnement des joints internes à la pièce).

2. Poser le matériau en suivant toujours le même sens de production (vérifiable par le tampon).

3. Adopter le module de pose en corbeille.

Effects on thermal expansions on the surfaces

The large thermal range (-15° + 70°) which is experienced on flat roofs also requires consideration regarding its effect on building materials and their different coefficients of expansion.
In this regard, building regulations normally provide for the incorporation of special elastic expansion joints in building structures, at the perimeter other locations.
Our pavers as well as having its specific thermal expansion coefficient and dynamic behavior, are laid down and installed on foundations and structures that may move. They can contract and expand in size, and depending on the total are being covered, this can range to as much as several cm.
Consequently it is possible this could result in some misalignment at the joints or in extreme cases with raised flooring and a pedestal system, uncoupling the plastic pedestal.
On the other hand, conventional bonded and grouted flooring can crack and deteriorate.
It is therefore essential to avoid or minimize the occurrence of these issues by providing large perimeter joints and avoiding where possible, placing heavy weights/structures on the pavers that would inhibit the essential movement of the paving.
When using a pedestal system, the area should be divided into distinct sections, particularly where there is any change in slope of the substrate.
Accessories are available as illustrated in this catalog and flexible jointing products are normally available at specialty retailers.

Effets des dilatations thermiques sur les surfaces

Les fortes oscillations thermiques (-15° +70° dans nos régions) auxquelles sont sujettes les couvertures planes, font qu'il est nécessaire de prendre en considération les effets que peuvent subir les matériaux de construction.
Matériaux qui ont souvent entre eux un coefficient thermique de dilatation différent.
Les réglementations prévoient la réalisation de joints élastiques de dilatation particuliers dans les structures de construction, dans le périmètre et dans le fractionnement des dalles.
Nos pavages, en plus d'avoir leur propre coefficient thermique de dilatation propre et comportement dynamique, sont posés et sont donc installés sur des sous-couches et structures qui bougent.
Ils se contractent et se dilatent de façon encore plus importante, en fonction des dimensions, sur divers cm.
L'effet qui pourrait se vérifier, également en rapport aux zones d'utilisation des pavages à sec, est un désalignement des joints dans le plancher surélevé ou de décrochage des pièces dans le module. En de cas de revêtements de sol collés, ceux-ci pourraient se casser et se détériorer.
Il est donc indispensable d'éviter/limiter l'apparition de ces aspects peu esthétiques en réalisant un joint périmétrique abondant et en évitant, dans la mesure du possible, le stationnement de structures/poids lourds qui entraveraient le mouvement correct du pavage.
Il est indispensable de fractionner le pavage en cas de module plastique, aussi au niveau du changement de déclivité de la dalle.
Pour cela, il est conseillé d'utiliser les accessoires prévus dans le catalogue et les joints élastiques/couvre-joints normalement disponibles auprès des revendeurs spécialisés.

POPA 2.0 recommendations for raised floor

The single slab POPA 2.0 modules are specifically designed for external use in elevated flooring installations. However there are currently no specific regulations or standards relating to the use of porcelain pavers for elevated exterior flooring. The closest standard to porcelain pavers is that relating to concrete paving slabs.
Under this test procedure, our POPA 2.0 complies with or exceeds the standard on all comparative tests, e.g. resists more than 1400 kg per slab (test result as per EN 1339 KN 14 >).
This means, according to the adopted standard, the material is suitable for "collective and public use without limitation of the height of the pedestals or sleepers".
In considering the use of POPA 2.0 porcelain pavers for raised flooring compared with conventional interior elevated flooring, the shock resistance of porcelain pavers is a factor that must always be taken into consideration (for example when a hard object such as a hammer or other solid object weighing 4.5 kg is dropped from a height of 40 cm) - as specified under EN 12825.
Despite the intrinsic density and stiffness of porcelain pavers, the slabs can nonetheless break or shatter if a heavy object is dropped onto them from a height. In consideration of the risk to anyone standing or walking on or standing on such slabs, in situations where hard and heavy objects are likely to be used or where floor heights are greater than 10 cm, it is recommended to apply a reinforcement to the underside of the slabs such as:

- glued fiber protection
- metal tray stuck
- overlapping metal tray

glued fiber protection
protection en fibre collée

metal tray stuck
bac métallique collé

overlapping metal tray

bac métallique surélevé

These applications do not increase the bearing capacity of the floor; they simply prevent it from caving in and reduce the risk of injury.

Recommandations pour la pose surélevée du POPA 2.0

Le produit POPA 2.0 autoportant est approprié à l'utilisation en extérieur pour les planchers en appui et surélevés. Il n'existe aucune réglementation "spécifique" pour les produits des espaces extérieurs en grès en surélévation, la plus proche de notre produit étant celle relative aux produits manufacturés en ciment.
Notre produit POPA 2.0 répond à cette réglementation de manière amélioratrice sur tous les essais de comparaison, par exemple, il résiste à +1400 kg par dalle (résultat de l'essai à la charge de rupture conformément à la norme EN 1339 KN > 14).
Selon la norme adoptée, cela veut dire que le matériau est adéquat "à l'utilisation collective et publique sans limitation de la hauteur des pieds ou traverses".

Si nous comparons par contre notre produit POPA 2.0 avec la législation sur les planchers surélevés pour intérieur, son point faible est la résistance à la charge/choc dynamique par corps dur (chute d'un marteau ou matériau rigide d'au moins 4,5 kg de 40 cm de haut) EN 12825.
En effet, la rigidité particulière du grès à ce type d'essai ne nous aide pas car la dalle peut se casser ou se briser, il faut donc prendre en considération ce risque et par rapport à cela, conseiller quelques domaines d'utilisation comme les ateliers mécaniques ou là où les hauteurs du sol sont supérieures à 10 cm, l'utilisation de protections à appliquer au dos des dalles :

- protection en fibre collée
- bac métallique collé
- bac métallique surélevé

Ces applications n'augmentent pas la portée du sol mais sont le gage d'une haute résistance à l'affaissement et limitent le risque d'accident.

Wind Uplift

When Kronos Porcelain pavers single slab are installed on a pedestal system, they essentially rely on gravity, their own weight (35lb), tight spacing between the pavers and tight containment around the perimeter to keep the pavers in place without movement. The open joint space between pavers allows wind to flow above, below and around the deck surface, which tends to reduce uplift forces somewhat and restricts movement of the pavers.

It should not however be inferred that uplifting of the pavers by wind will never occur as it is difficult, if not impossible, to test for every contingency or circumstance where wind uplift may be possible.

The Saffir-Simpson Hurricane Wind Scale defines wind speeds over 74 mph to be hurricane velocity, where for example it is stated that a Category 1 (74-95mph) storm means: 'Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters.' Furthermore, It is generally accepted that the average person standing on the open ground will be rocked around at wind speeds of 35-40mph; it's difficult to stand up and you would stumble frequently.

The only wind uplift test for roofing products known to Kronos is the Florida Building Code 2007 TAS 108 Test Procedure for testing air permeable rigid discontinuous roof systems. Whilst this test procedure may have some relevance to pavers installed in 'floating' deck applications, Kronos engaged the Florida International University International Hurricane Research Center to devise a series of tests to evaluate the resistance of porcelain pavers to wind uplift using the FIU's Wall of Wind facility.
Variables incorporated in the test program included different wind angles, pedestal height and type, parapet wall height, paver layout and the use of locking devices along the parapet walls.

This report is intended to provide additional information about wind uplift where ¾" single slab porcelain pavers as supplied by Kronos are installed on fixed or adjustable height pedestals. It should not be construed as a guarantee or warranty of any kind, including but not limited to warranties of merchantability or fitness of porcelain pavers for a specific purpose. None of the information contained in this report is intended to substitute for the engineer's, specifier's, architect's, builder's or contractor's own analysis, investigation, and due diligence regarding the appropriate choice, application and installation of ¾" single slab porcelain pavers on fixed or adjustable height pedestals in any particular location or application, which is not the responsibility of Kronos.

The test report is available on request from Kronos on the strict understanding that it is provided for the exclusive use of the recipient. No reproduction or transmission by facsimile, email or other electronic means is permitted without Kronos specific permission.

Soulèvement à cause du vent

Dans la pose surélevée, la dalle en grès est stable grâce à la force de gravité, à son poids équivalent à 16 kg, à la distance négligeable entre les différents modules, à l'utilisation de plots pour le maintenir continu avec une déclivité unique et au périmètre de confinement présent autour du sol.
Grâce à l'absence de joints entre une dalle et l'autre, le vent parvient à s'infiltrer dans la fissure entre les différents modules, aussi bien en-dessous qu'autour du pavage, permettant de réduire en partie la force de soulèvement et limiter les déplacements du sol.
Cela ne signifie toutefois pas que le soulèvement du pavage à cause du vent ne puisse pas se produire car il est très difficile, voire impossible, d'examiner toutes les circonstances dans lesquelles ce phénomène se vérifie.

L'échelle Saffir-Simpson-Hurricane Wind établit que le vent dont la vitesse dépasse 119 km/h doit être défini ouragan. Il est établi par exemple que la Catégorie 1 (119-153 km/h) indique : « Vent très dangereux pouvant causer de nombreux dégâts aux toits, tuiles, revêtements extérieurs latéraux et aux gouttières des habitations construites selon les réglementations ». De plus, il est reconnu par tous qu'une personne se tenant debout dans un espace ouvert puisse être bousculée à une vitesse du vent de 90-103 m/h, qu'il est difficile de rester debout et le risque de trébucher est élevé.

N'existant aucun test spécifique pour le soulèvement de pavages d'extérieur à cause du vent, Kronos a interpellé le Centre international de Recherche sur les Ouragans de l'Université de Floride pour qu'il essaie de concevoir une série d'essais en mesure de déterminer la résistance du sol en grès cérame au soulèvement par le vent. Les variables insérées dans le programme des essais comprennent les différentes directions du vent, les hauteurs et typologies de supports, la hauteur des parapets, la configuration du sol et l'utilisation de systèmes d'ancrage tout le long du périmètre du pavage.

Cette étude apporte des informations supplémentaires sur le soulèvement, par le vent, des dalles de 2 cm fournies par Kronos Ceramiche et posées sur des plots fixes ou réglables. Elle ne constitue aucune garantie comme, par exemple, la garantie de commercialisation ou l'aptitude du sol en grès cérame à un usage spécifique. Aucune des informations contenues dans le rapport ne remplace l'analyse, l'étude et la diligence des architectes, ingénieurs, constructeurs ou entrepreneurs, sur le choix adéquat, l'utilisation et la pose surélevée de dalles de 2 cm qu'il faut également évaluer en fonction de la position géographique de l'intervention. Kronos Ceramiche n'est pas responsable des phases que nous venons d'énumérer.

L'essai est disponible sur demande et est uniquement et exclusivement fourni en vue de l'utilisation personnelle du demandeur. Aucune reproduction ou transmission par fax, e-mail ou autres moyens n'est permise sans l'autorisation spécifique de Kronos.

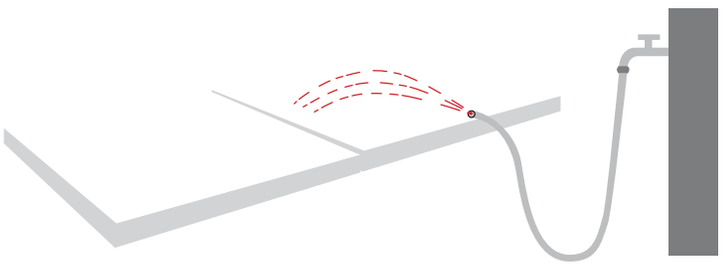
cleaning and maintenance
NETTOYAGE ET ENTRETIEN

The good drainage characteristics of the pavers allows for direct cleaning using running water. The grout lines between the slabs ensure effective drainage towards the perimeter drain, which permits quick dispersal of large amounts of water.

For cleaning and maintenance of paved areas, use a neutral detergent and running water to remove dirt. For large surfaces, we recommend industrial cleaners such as Pulivapor machines.

La haute capacité drainante du revêtement de sol permet un nettoyage direct à l'eau courante ou au jet. Les joints entre les lattes permettent un drainage efficace vers le point/joint d'écoulement périmétrique, cette caractéristique permet de drainer rapidement de grandes quantités d'eau.

Pour le nettoyage et l'entretien du revêtement de sol, un produit détergent neutre et un jet d'eau suffisent pour éliminer et convoyer la saleté en direction des joints et des bouches de drainage.
Pour les grandes surfaces, il est conseillé d'utiliser le nettoyage à la vapeur.



It should also be borne in mind that any construction or flooring product for outdoor use always retains some water unless set with a steep slope. This is the effect of the water's surface tension,which enables a beacker to be filled well beyond its edge, creating the dome effect.

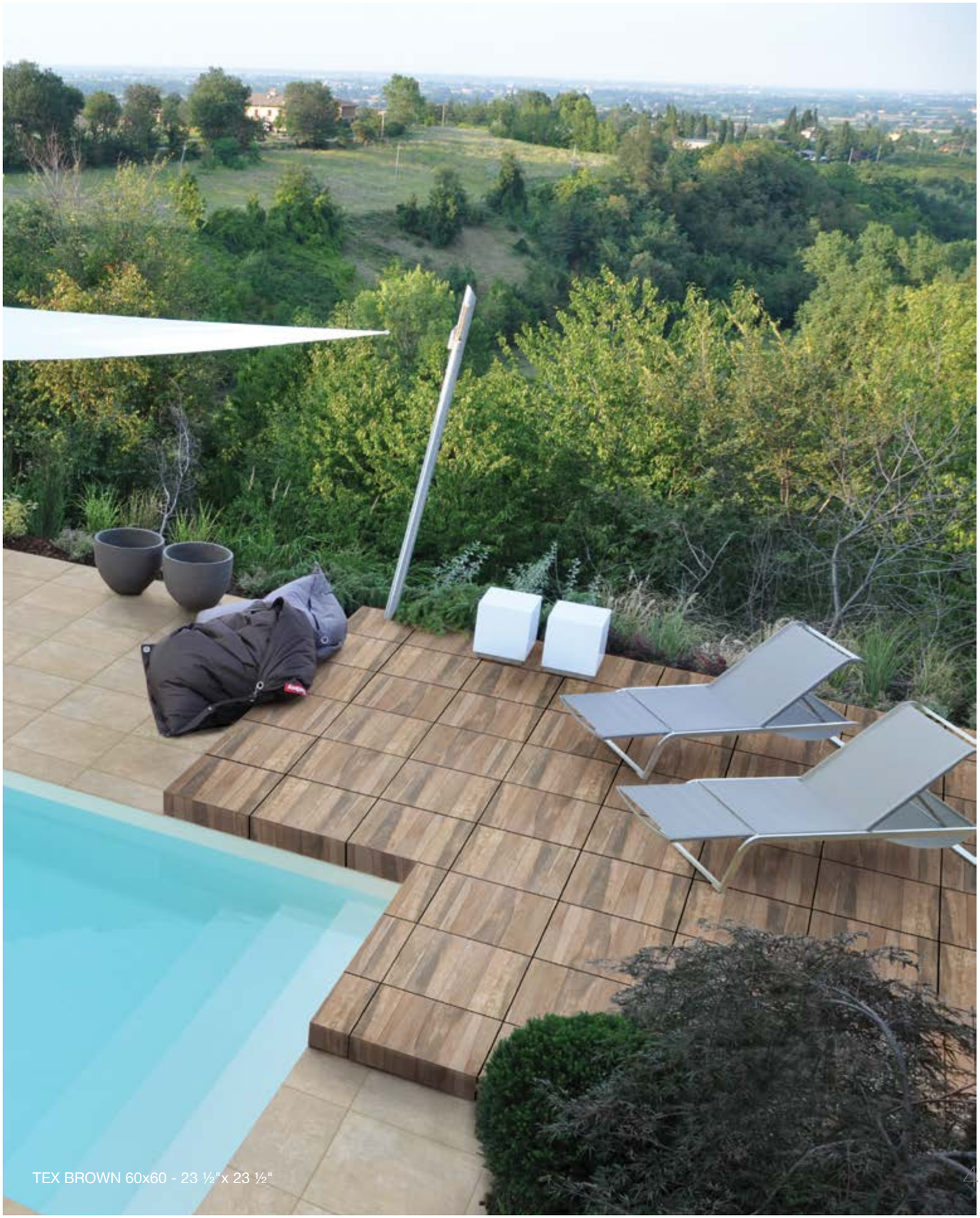
One particular point to note with porcelain pavers is that when they are laid either level or on a slight slope only, the surface may retain some water. This phenomenon is just like you will find when water covers a flat sheet of glass and is due to the surface tension of water and the fact the porcelain slabs have almost zero water absorption.

To remove dry residue such as leaves or dust, use a garden blower.

Il faut également savoir que tout produit de construction/pavage pour espaces extérieurs retient une quantité d'eau minime à la surface s'il n'est pas fortement incliné. Il s'agit de l'effet dérivant de la tension superficielle de l'eau qui, comme dans le cas d'un verre rempli à ras bord le fait remplir d'eau bien au-delà du bord, créant l'effet coupole.

Pour favoriser le séchage complet du revêtement de sol, dans la mesure où le bas-relief céramique retient un minimum d'eau, il est conseillé de prévoir une action mécanique (avant que l'eau ne sèche pour prévenir les auréoles de dépôt de calcaire) à l'aide d'une brosse en nylon à dents serrées, genre celles pour les piscines, et l'utilisation d'une brosse avec racloir en caoutchouc de manière à également éliminer la quantité d'eau restante.

Pour éliminer les résidus secs, poussière, feuilles, etc., utiliser un souffleur/ aspirateur mécanique de jardin.



TEX BROWN 60x60 - 23 ½"x 23 ½"

TECHNICAL CHARACTERISTICS

STANDARDS	CHARACTERISTICS OR PROPERTIES	COMPLIANCE WITH STANDARDS UNI EN 14411 G ASTM	DECLARED VALUE
ISO - 10545-3 **ASTM - C 373-88**	Water absorption	E < = 0.5 %	< 0.1 %
ISO - 10545-9 **ASTM - C 484**	Thermal shock resistance	Requested	Complies with standard
ISO - 10545-12 **ASTM - C 1026**	Frost resistance	Requested	Complies with standard
ISO - 10545-6 **ASTM C - 1243-93**	Abrasive wear	<175 mm^2	139 mm^2
ISO - 10545-2	Straightness / ASTM - C 485	+/- 0.75 % (+/- 1.8 mm)	Complies with standard
	Straightness / ISO - 10545-2	+/- 0.5 % (+/- 1.5 mm)	Complies with standard
	Thickness / ASTM - C 499	+/- 1.02 mm	Complies with standard
	Thickness / ISO - 10545-2	+/- 0.5 % (+/- 0.5 mm)	Complies with standard
	Length and width / ASTM - C 499	+/- 0.5 % (+/- 2.0 mm)	Complies with standard
	Length and width / ISO - 10545-2	+/- 0.6 % (+/- 2.0 mm)	Complies with standard
ISO - 10545-4 Bending strength in N (thickness > = 7,5 mm)	ASTM - C 648	> = 250 LBF Average	> = 225 LBF Individual
	ISO - 10545-4	> = 1300 Newton	> 13000
ASTM - C 650	Chemical resistance	As reported	Resistant
ISO **10545-14**	Resistance to stain	-	5
ISO **10545-13**	Chemical resistance	UB min.	UA ULA UHA
ISO **10545-8**	Coefficient of linear thermal-expansion	-	60 6,3x10 c'
ISO **10545-5**	Impact resistance	-	0.88
EN **12825**	Static load	-	Centre 9,6 Kn Centre point of sides 6,5 Kn Diagonal 8,19 Kn (CLASSE 3)
	Dymanic laod capacity - hand object impact test	-	Test not passed
	Dymanic laod capacity - soft object impact test	-	Test passed
EN **1339**	Bendind strength - breaking force in N	Kn 14.38	classe 14
ENV **12633**	Slip resistance	> / = CL1	CL 2
DIN **51130**	Slip resistance	-	R11
DIN **51097**	Slip resistance	-	A + B + C min.
DM 236/89 **B.C.R.A.**	Slip resistance	-	> 0.40
Static coefficient of friction **ASTM 1028-07 BOT 3000** **Dynamic coefficient of friction** **(sectio n 9.6 ANSIA 137.1 2012)**	Slip resistance	-	> 0.60 WET > 0.60 DRY <0.42
EN **13501-1**	Fire resistance	-	A1 - A1 FL

PACKAGING

2.0 MONOLITHIC RECTIFIED CERAMIC TILE		Thickness	Unit / Box	SqFt / Box	Boxes / Pallet	SqFt / Pallet	Weight / Box	Weight / M2	Weight / SqFt	Weight / Pallet	Pallet Size
US7903	Moonstone 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7904	Creamstone 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7900	Grey 23 ½ -in x 23 ½ -in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7901	Brown 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7902	Ivory 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7906	Ipè 23 ½-in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7905	Teak 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7903	Moonstone 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7904	Creamstone 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7900	Grey 23 ½ -in x 23 ½ -in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7901	Brown 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7902	Ivory 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7906	Ipè 23 ½-in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"
US7905	Teak 23 ½ -in x 23 ½-in	3/4" - 20mm	2	7.75	36	279	73 lb	100,5 lb	9.4 lb	2650 lb	42"x 42"

IVORY 60x60 - 23 ½"x 23 ½"

OCEAN STONE BLACK 60x60 - 23 ½"x 23 ½"

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