An Italian porcelain paver made in USA

ORGANIZER

POPA 2.0

KRONOS USA
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 and 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.

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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 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 high quality tile.

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 obtains most of its natural raw materials for tile production in the american territory. All the raw materials come from a radius of 800 Kms / 500 Mls from the production plants.

H2O MANAGEMENT AND PURIFICATION
All water-waste is reused through the manufacturing process, this is already 100%.

RECYCLED/RECYCLABLE PACKAGING 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 developed specific systems to install its Porcelain Pavers without cement, glue, 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.

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REGIONAL MATERIALS, MR Credit 5.2 (2 LEED points)
Kronos USA products are made in the United States and do not contribute to the change of 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)
Kronos USA tiles are produced in manufacturing plants which have got the prestigious ecological mark ECOLABEL (EU Regulation 2002/27/ECC).

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:
- safety and health of Kronos Usa workers and customers.
- continuous improvement of the environmental performances of Kronos USA products and manufacturing sites;
- healthcare of Kronos Usa workers and customers.

WHY CHOOSE POPA 2.0?
- Lighter and easier to handle than concrete blocks
- Superior in fire resistance and durability to wood tiles
- Superior in strength and impact resistance to ceramic tiles
- Supports over 200lb
- More cost effective than grating or grid structures for elevated paving installations
- Resistant to damage by frost, snow, ice and heat [–40°F / 210°F]
- Removable and reusable
- Available in a broad range of colors/styles
- Installation on single ply membranes
- Massive over life cost savings
- Inspectable and removable
- Easy to install
- Easy to clean, stain, chemical and salt resistant
- Fade resistant
- Slip resistant and quick draining
- Virtually no maintenance
- Thermal insulation (hot/cold)
- The slight gap between gres slabs allows a quick water drainage
- Best acoustic
- Insulation
- It allows for planar and uniform surfaces with no uneven levels or visible water drainage systems (grids or water discharge pipes)
- No load bearing in attics and on balconies as the last layer of concrete and glue is not necessary

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

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

KRONOS Porcelain Pavers are produced in the U.S., the manufacturing plants are located in Tennessee. The factory is member of the U.S. Green Building Council, which is an organization that 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)
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BLUE STONE | *Full Color Cleft Pattern*

An Italian porcelain paver made in USA

- **US7902**: ¾” thickness, 30x120 cm
- **US7916**: ¾” thickness, 60x60 cm
- **1100457**: 1¾” thickness, 60x60 cm
- **US7918**: ¾” thickness, 30x30 cm
- **US7920**: ¼” thickness, 60x120 cm
- **US7922**: ¼” thickness, 30x120 cm

BLUE STONE | *Full Color Cleft Pattern*
BLUE STONE | True Blue Thermal Pattern

US7901
3/4\" thickness
US7917
23\½"X 23\½", rectified
60x60 cm
US7919
11\½"X 11\½", rectified
30x30 cm
US7921
23\½"X 47\½", rectified
60x120 cm
US7923
11\½"X 47\½", rectified
30x120 cm

An Italian porcelain paver made in USA

Thermal Pattern
STONE | Moonstone

An Italian porcelain paver made in USA

US7903
¾” thickness
231/3”X 23 1/3” rectified
60x60 cm

1103013
113/4”X 23 1/3” rectified
30x60 cm
STONEx Creamstone

An Italian porcelain paver made in USA

¾” thickness

US7904
23 1/3” X 23 1/3” rectified
60x60 cm

US7934
11 3/4” X 11 3/4” rectified
30x30 cm

US7940
11 3/4” X 23 1/3” rectified
30x60 cm
An Italian porcelain paver made in USA

¾” thickness

US7908
23 1/3" X 23 1/3” rectified
60x60 cm

113/4 "X 23 1/3” rectified
30x60 cm

ICON TRAVERTINE | Pearl
An Italian porcelain paver made in USA

¾” thickness

US7909
60x60 cm

1100016
30x60 cm

ICON TRAVERTINE | River
An Italian porcelain paver made in USA

- **QUARTZITE | Crystal White**
  - 1716: ¾” thickness
  - US7907: 23 1/3” x 23 1/3” rectified
    - 60 x 60 cm
  - 1100017: 11 3/4” x 23 1/3” rectified
    - 30 x 60 cm
QUARTZITE | Sandy Island

An Italian porcelain paver made in USA

¾” thickness

US7910
23 1/3" X 23 1/3" rectified
60x60 cm

1103018
11 3/4" X 23 1/3" rectified
30x60 cm

SANDSTONE
Sandy Island
QUARTZITE Laguna

An Italian porcelain paver made in USA

¾" thickness

US7915
23 1/3" X 23 1/3" rectified
60x 60 cm

QUARTZITE Lagun
QUARTZITE | Cloud

An Italian porcelain paver made in USA

¾” thickness

US7914
Cloud 23/3” x 23 1/3” rectified
60x60 cm

QUARTZITE
Cloud
OCEAN STONE | White Cool

- An Italian porcelain paver made in USA
- ¾” thickness
- 1100019 113/4” X 23 1/3” rectified 30x60 cm
- US7911 231/3” X 23 1/3” rectified 60x60 cm
OCEAN STONE | Black

- An Italian porcelain paver made in USA
- ¾” thickness
- 11,00021: 1 1/4” x 2 1/3” rectified (30 x 60 cm)
- US7912: 23 1/3” x 23 1/3” rectified (60 x 60 cm)
An Italian porcelain paver made in USA

OCEAN STONE | Tan

US7913
¾” thickness
13/16” X 13/16” rectified
30x30 cm

1100230
¾” thickness
17/16” X 17/16” rectified
30x30 cm
TEX WOOD | Grey

An Italian porcelain paver made in USA

¾” thickness

US7900
23 1/3” X 23 1/3”, rectified
60x60 cm
An Italian porcelain paver made in USA

TEX WOOD | Brown

¾” thickness

US7901
Brown 23 1/3" rectified
60x60 cm
TEX WOOD | Ivory

An Italian porcelain paver made in USA

¾" thickness

US7902
231/3" X 23 1/3 " rectified
60x 60 cm

TEX WOOD

Ivory
An Italian porcelain paver made in USA

¾” thickness

US7905
23 1/3" x 23 1/3" rectified
60 x 60 cm

TIMBER WOOD | Teak

TIMBER SURFACES
TIMBER WOOD | Ipe’

An Italian porcelain paver made in USA

¾" thickness

TIMBER SURFACES

US7906
23 1/3"X 23 1/3 " rectified
60x 60 cm
An Italian porcelain paver made in USA

COTTO

US7924
3/4” thickness
23 1/3” x 23 1/3” rectified
60x60 cm

1100522
11 3/4” x 23 1/3” rectified
30x60 cm
Laying in Instruction

Laying 2 cm - 3/4" in outdoor

Consequently, the size and nature of the porcelain stoneware slabs, due to the pronounced anti-slip surface (which always retains a thin layer of water), special attention should be given to the slope and inclination %, that the customer wants to give to the floor plan and direction laying of the slab stoneware. The % of slope and slope of the floor must meets the architectural choices of the project and the needs for natural runoff of rainwater. These vary according to the geographical area, orientation and exposure of the affected area, if it is completely bare, etc. etc.

By example of way, not binding, of the Swiss office UPI, recommends slopes not less than 1, 5 % per linear meter.

Cutting

To cut 2 cm - 3/4" make the measurements needed and mark the part to be removed on the piece, then cut with an electric tool or water-cooled circular construction saw.

The Doghe (grout staves) SKE 2.0 and “Struttura Exter” 60x60 - 23½"x23½" (1 cm - 0.39")

Consequently the special structure (bas-relief grooves) which reproduces a wood grooves effect the exterior staves dimensions of each piece may have subtle differences from inner staves. This due to the caliber of production that can have significant dimensional variations to each production. Unfortunately this affects the outside slabs only.

For this reason the products concerned must have a minimum aesthetic tolerances, to improve then we may recommend the following countermeasures:

1. To use pedestals with crosses of at least 4 mm - 0.15" in order to have the same size for the joint (SKE 2.0).
2. In the traditional installation use crosses to 4 mm - 0.15" (the aim is repealing the same internal dimensional leakage per piece).
3. To lay down the material following always the same production (verifiable from the back of the slab).
4. Adopt the basket diagram laying.

Thermal expansions effects on surfaces

The strong thermal expansions (1 -15 °C) which are subjected the FLAT ROOFS, involve the need to consider the effects on building materials.

- Materials often have among their different COEFFICIENT of dilatation.
- The regulations provide for the establishment of special ELASTIC expansion JOINTS in building structures, in the perimeter and in the fractionation of insulates.
- Our flooring as well as having its own THERMAL EXPANSION COEFFICIENT and their dynamic behavior, they lay down and are installed on foundations and structures that move.
- They contract and dilate in measure also important depending on the size even for some cm.
- The effect that you might encounter in relation to the use of dry flooring is a misalignment of joints in release of raised floor or uncooping the plastic module. If they would be glued flooring instead, they might break and deteriorate.
- It is therefore essential to avoid or limiting the occurrence of these flaws, making a large perimeter joints and avoiding, where possible, the thinning of heavy weight/structures that inhibit the correct movement of the flooring. It is necessary to spell up the flooring area in the case of plastic module also at the slope change of the base.

The MONOLITHIC product SKE is self-carrying 2.0 is definitely suitable for external use for support and elevated installation. There is no specific legislation for outdoor products in porcelain in elevation, the closest to our product is relating to the cement slabs (concrete).

To the legislation our SKE 2.0 RESPONSES IMPROVEMENT on all comparative tests, e.g. resist less than 1400 kg per slab (test result as per EN 1339 KN 14 x).

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”.

Recommendations for SKE2.0 on elevated installation

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If we compare our product SKE 2.0 to the elevated indoor norms, his weakness point is the LOAD/DYNAMIC HARD body (SHOCK for example a hard object fall such as a hammer or other rigid material of less than 4.5 kg from 40 cm - 16" height) (EN 1335).

In fact the particular stiffness of the gres porcelain does not help us, because the gres slab can break or shatter, we must therefore consider this risk and in face of this advise in some cases such as mechanical workshop or where floor heights are higher than the 3.99" (10 cm) using reinforcements to be applied on the back of the slabs:

- metal tray
- SHOCK CONTROL® protective layer

These applications do not increase the floor weight capacity, but they are just a guarantee against breakage and limit the risk of accidents.

Wind Uplift

When Kronos porcelain pavers single slab are installed on a pedestal system, they essentially rely on gravity, its own weight equal to 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 Baltic 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 loading 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, parapet height and type, parapet wall layout, and the use of doublex testing along the parapet walls.

This report is intended to provide additional information about wind uplift where 1½” single slab porcelain pavers are 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 1½” single slab porcelain pavers or 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.
A laying solution

- Nr. 1 pcs 231/3" X 231/3" - 60x60 cm: 57.2%
- Nr. 1 pcs 113/4" X 231/3" - 30x60 cm: 28.5%
- Nr. 1 pcs 113/4" X 113/4" - 30x30 cm: 14.3%

B laying solution

- Nr. 1 pcs 231/3" X 231/3" - 60x60 cm: 40%
- Nr. 2 pcs 113/4" X 231/3" - 30x60 cm: 40%
- Nr. 2 pcs 113/4" X 113/4" - 30x30 cm: 20%

C laying solution

- Nr. 2 pcs 231/3" X 231/3" - 60x60 cm: 44.5%
- Nr. 3 pcs 113/4" X 231/3" - 30x60 cm: 33.3%
- Nr. 4 pcs 113/4" X 113/4" - 30x30 cm: 22.2%

D laying solution

- Nr. 1 pcs 231/3" X 231/3" - 60x60 cm: 50%
- Nr. 2 pcs 113/4" X 231/3" - 30x60 cm: 50%

E laying solution

- Nr. 1 pcs 231/3" X 231/3" - 60x60 cm: 66.7%
- Nr. 1 pcs 113/4" X 231/3" - 30x60 cm: 33.3%
SPECIAL PIECES

DOUBLE BEVEL COPING
30x60 - 11¾” x 23½”
Available in all colours.

FULL BULLNOSE COPING
30x60 - 11¾” x 23½”
Available in all colours.
TECHNICAL CHARACTERISTICS

STANDARDS CHARACTERISTICS OR PROPERTIES COMPLIANCE WITH STANDARDS DECLARED VALUE

ISO - 10545-2 Water absorption E = 0.5 % < 0.1 %

ISO - 10545-2 Thermal shock resistance Requested Complies with standard

ISO - 10545-12 Frost resistance Requested Complies with standard

ISO - 10545-2 Abrasive wear <175 mm3 130 mm3

ISO - 10545-9 Bending strength in N (thickness >= 7.5 mm) > = 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 LLA ULA

ISO 10545-4 Coefficient of linear thermal-expansion - alpha =6.3x10^-6 °C^-1

ISO 10545-6 Impact resistance - 0.88

EN 1339 Static load - Centre 2.5 kN Centre point of sides 5.1 kN Diagonal 8.19 kN (CLASSE 3)

Dynamic load capacity - hand object impact test - Test not passed

Dynamic load capacity - soft object impact test - Test passed

EN 12633 Bendind strength - breaking force in N Kn 14.38 class 14

EN 12633 Slip resistance > / = CL 1 CL 2

DIN 51130 Slip resistance - R11

DIN 51130 Slip resistance - A + B + C min.

DIN 18130 Slip resistance - > 5.40

DIN R 18130 Slip resistance - > 5.40 WET > 5.00 DRY

EN 1339 Slip resistance - > 0.42

EN 1339 Fire resistance - A1 - A1 FL

2" TAS TTB FLORENCE BUILDING CODE WIND UP LIFT TEST

2½" Thick 3¼" x 3¼" porcelain installed on fixed height pedestals and 45° wind angle was blow of at

30 mph with no parapet

130 mph with 10" high parapet

2.0 MONOLITHIC RECTIFIED CERAMIC TILE Thickness Unit / Box Soft / Box Soft / Pallet Weight / Box Weight / Pallet Thickness Unit / Box Weight / Pallet (included)

2½" x 2½" 2 - 15.5 16 248 150 lb 100 lb 9.3 lb 244 lb 24" x 48"

2½" x 2½" 4 - 15.5 16 248 150 lb 100 lb 9.3 lb 2456 lb 24" x 48"

11½" x 11½" 2 - 7.75 36 279 72 lb 100 lb 5.3 lb 2672 lb 42" x 42"

11½" x 11½" 4 - 7.75 40 310 75 lb 100 lb 5.3 lb 2995 lb 42" x 42"

11½" x 11½" 5 - 4.85 40 218 45 lb 100 lb 9.3 lb 2289 lb 42" x 42"