

URBAN

POPA 2.0

CONTEMPORARY
PORCELAIN
PAVER

ITALIAN STYLE
MADE IN USA



KRONOS
USA

URBAN

POPA 2.0

CONTEMPORARY
PORCELAIN
PAVER

ITALIAN STYLE
MADE IN USA

KRONOS USA introduces the new URBAN project, created for public and meeting spaces in the city, such as cafés, hospitality areas, restaurants and hotels.

MONOCROMATICA and TERRAZZO represent two ideal solutions for outdoor floors, combining highly technical characteristics together with a strong visual impact.

MONOCROMATICA

COLORS

COLD



bone

ash

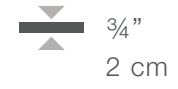
basalt

SIZES

23½"x23½"
60x60 cm
RECTIFIED

11¾"x23½"
30x60 cm
RECTIFIED

THICKNESS

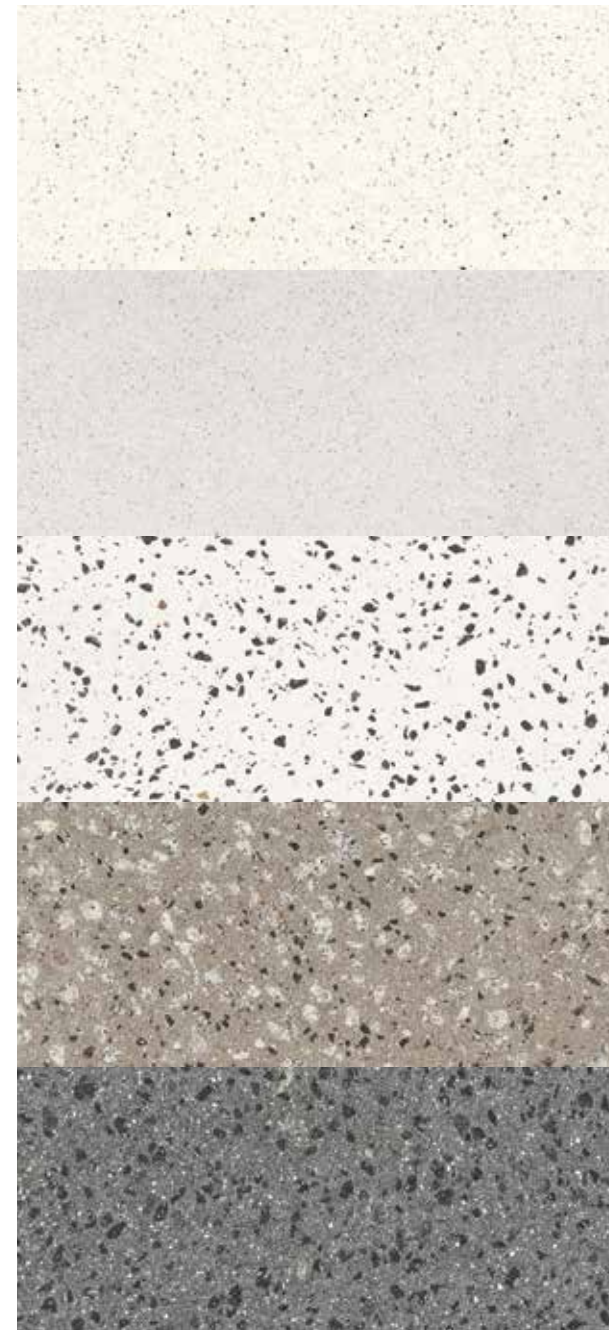


TERRAZZO

COLORS

SIZES

THICKNESS



cool
white

cool
grey

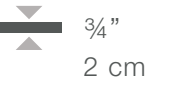
white
black

grey
black

charcoal

23½"x23½"
60x60 cm
RECTIFIED

11¾"x23½"
30x60 cm
RECTIFIED



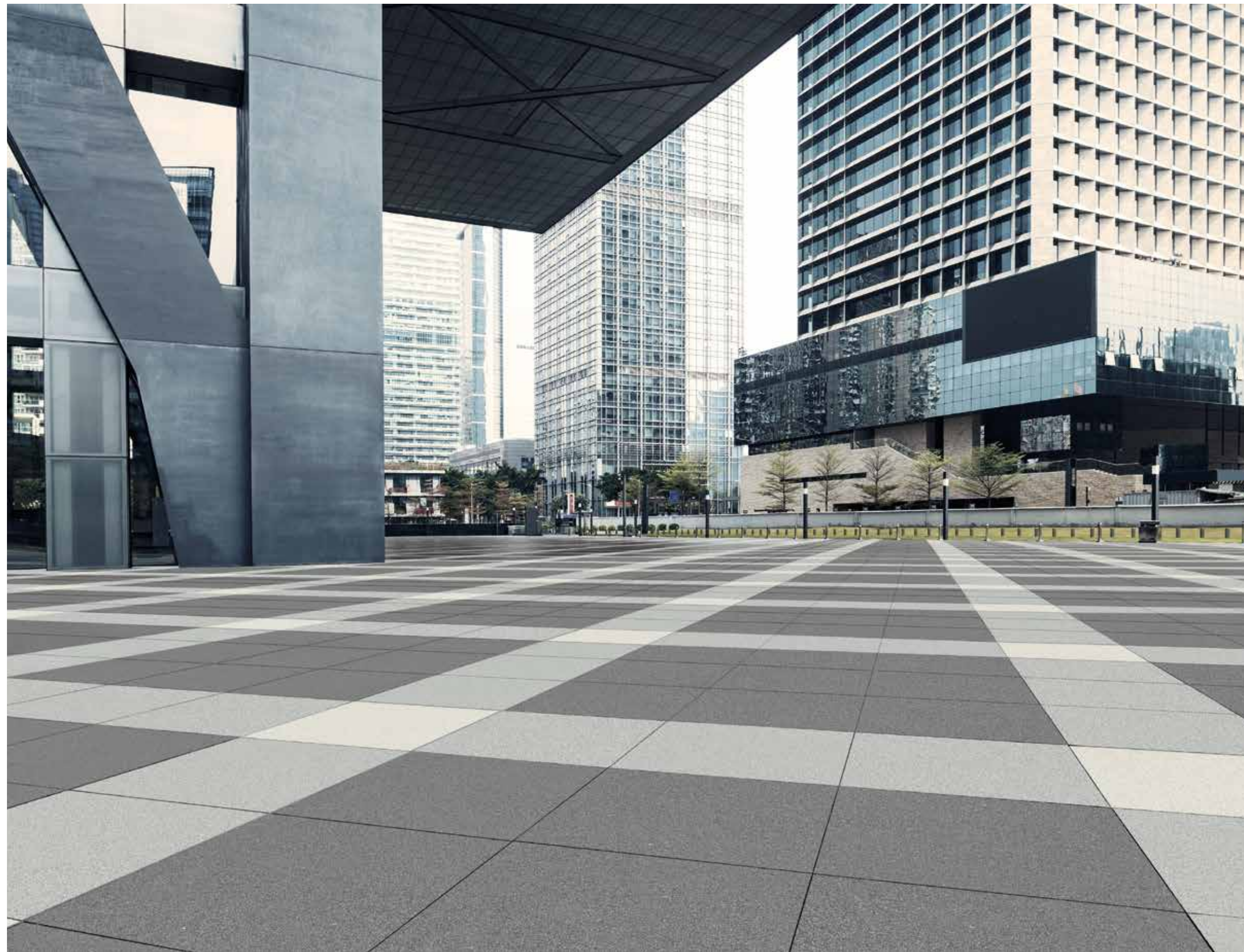
WARM



sand

cognac

leather



MONOCROMATICA

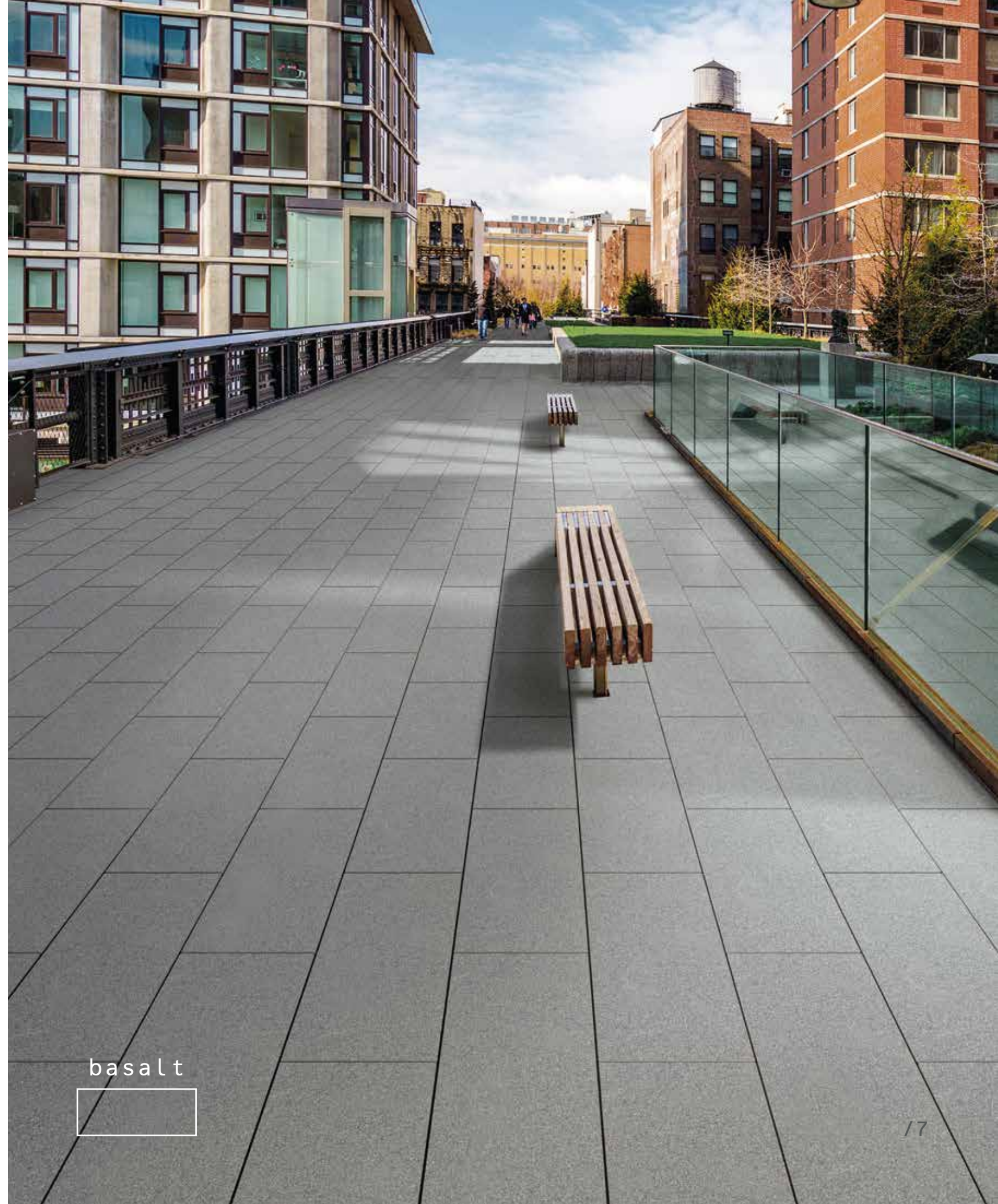
bone / ash / basalt





MONOCROMATICA

ash / basalt



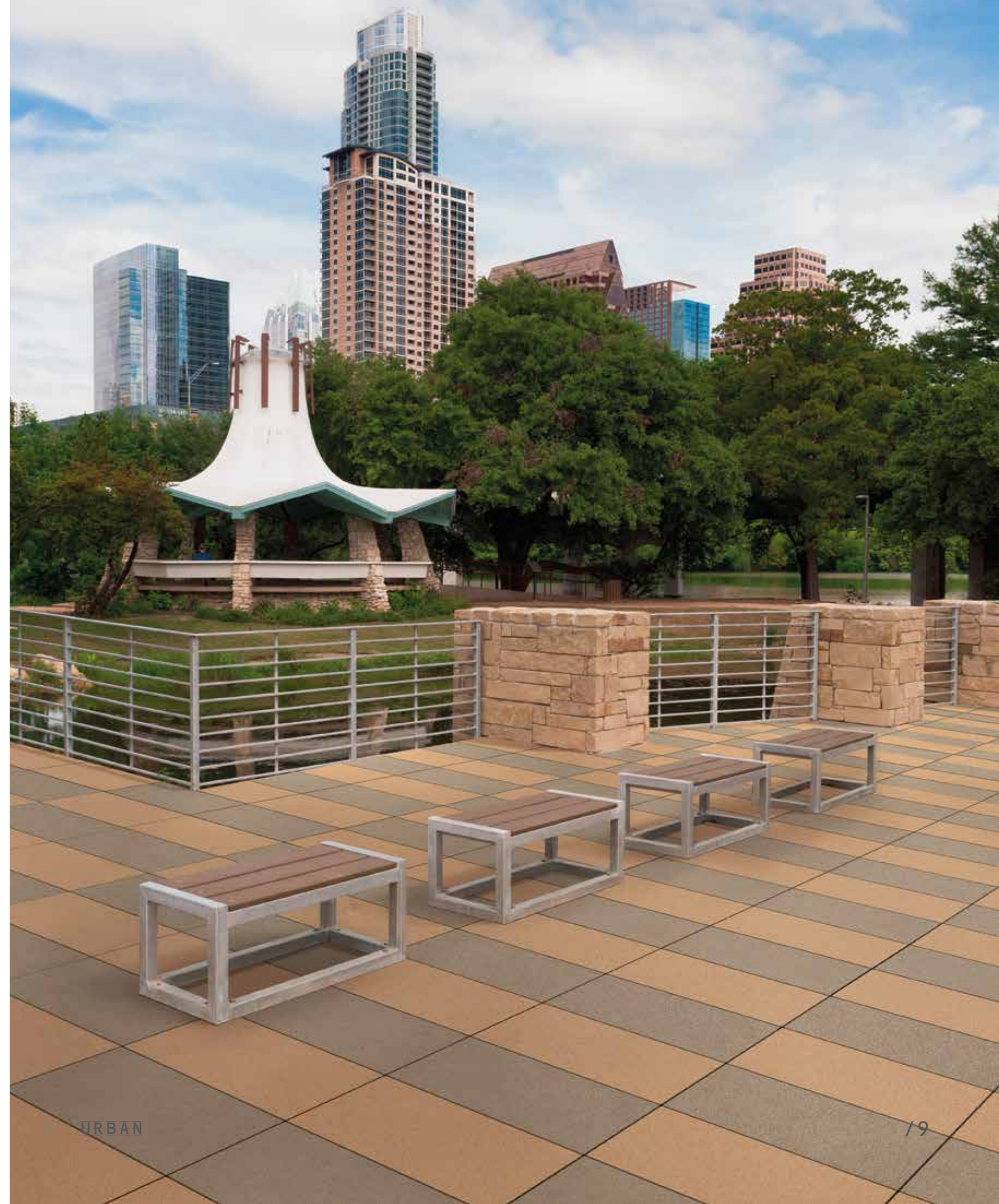
basalt





MONOCROMATICA

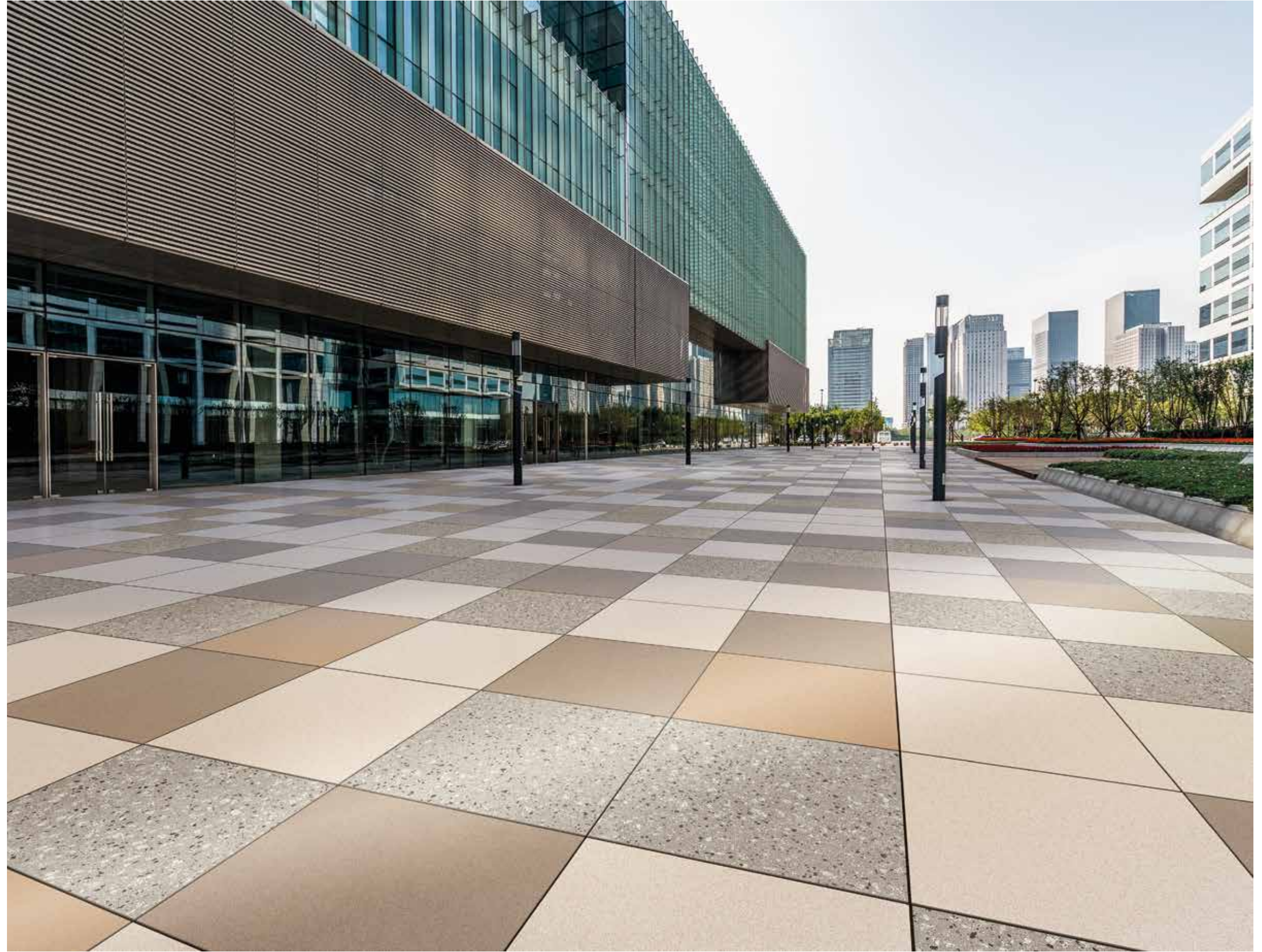
cognac /leather



MONOCROMATICA

sand / bone





MONOCROMATICA
+ TERRAZZO

sand / cognac



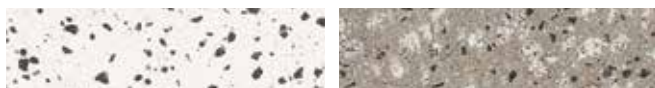
leather / g.black





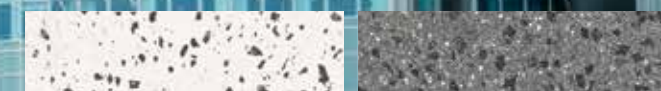
TERRAZZO

white black / grey black



TERRAZZO

white black / charcoal





TERRAZZO

grey black

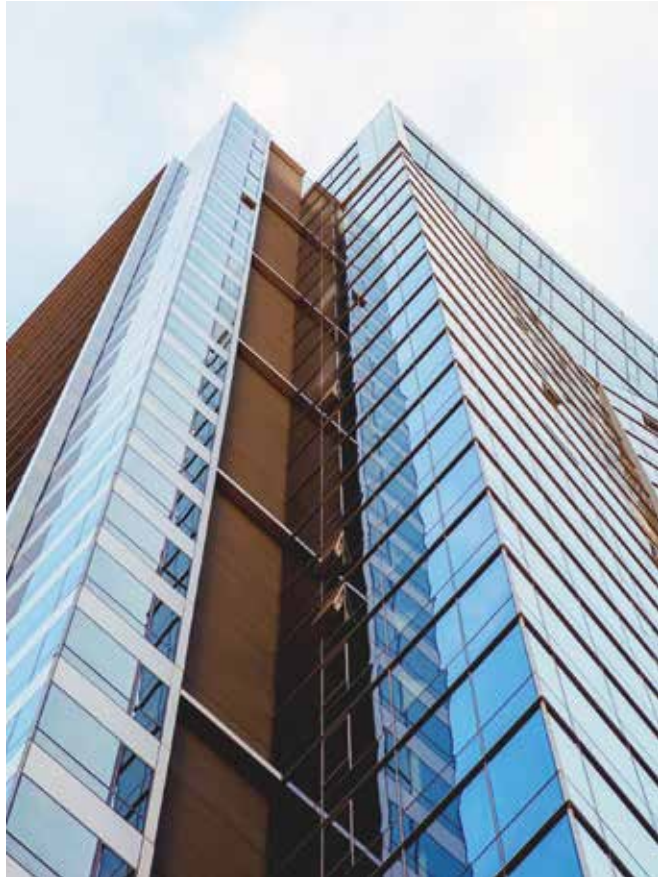




TERRAZZO

cool white / cool grey






TERRAZZO

white / grey
black / black / charcoal



MONOCROMATICA

 3/4" thickness

Bone



US7938
23 1/2" x 23 1/2" rectified
60x60 cm



1100032
11 3/4" x 23 1/2" rectified
30x60 cm



100%



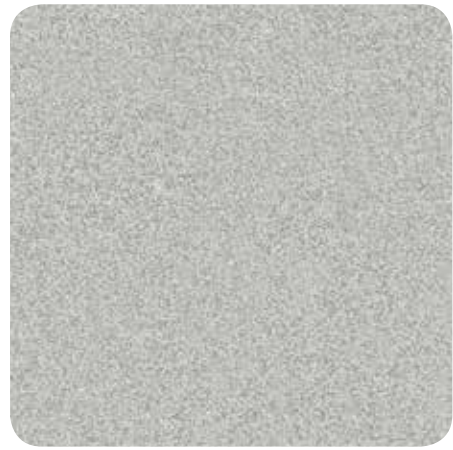
Ash



US7937
23 1/2" x 23 1/2" rectified
60x60 cm



1100031
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Basalt



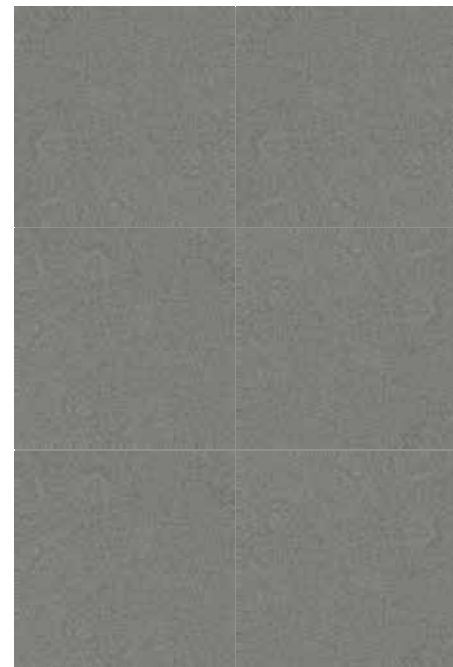
US7936
23 1/2" x 23 1/2" rectified
60x60 cm



1100030
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Sand



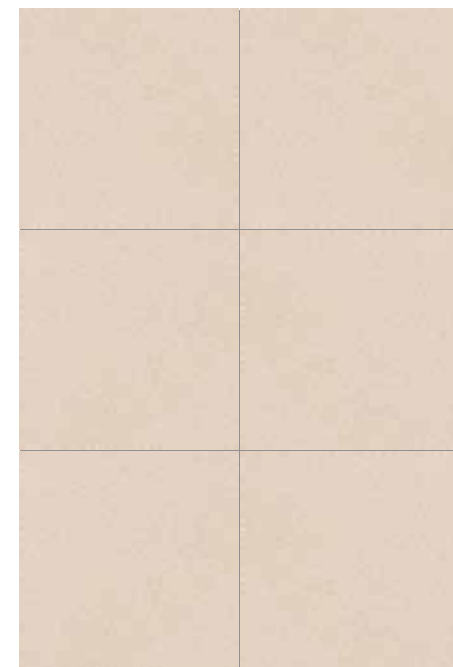
US7935
23 1/2" x 23 1/2" rectified
60x60 cm



1100029
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Cognac



US7934
23 1/2" x 23 1/2" rectified
60x60 cm



1100028
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Leather



US7939
23 1/2" x 23 1/2" rectified
60x60 cm




1100033
11 3/4" x 23 1/2" rectified
30x60 cm



100%



TERRAZZO

 3/4" thickness

White Black



US7933
23 1/2" x 23 1/2" rectified
60x60 cm



1100027
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Grey Black



US7932
23 1/2" x 23 1/2" rectified
60x60 cm



1100026
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Charcoal



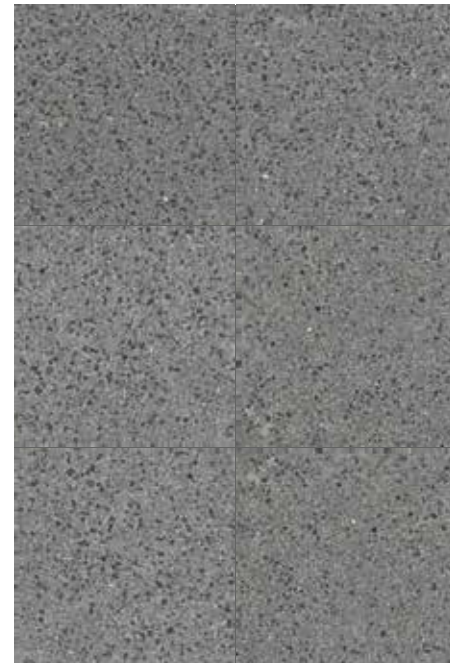
US7931
23 1/2" x 23 1/2" rectified
60x60 cm



1100025
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Cool White



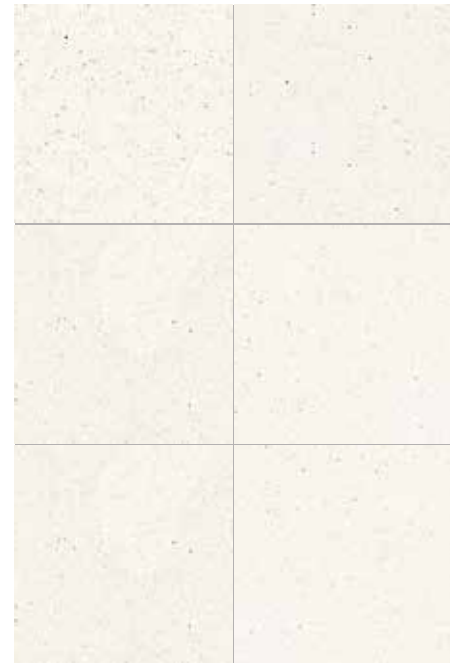
US7929
23 1/2" x 23 1/2" rectified
60x60 cm



1100023
11 3/4" x 23 1/2" rectified
30x60 cm



100%



Cool Grey



US7930
23 1/2" x 23 1/2" rectified
60x60 cm



1100024
11 3/4" x 23 1/2" rectified
30x60 cm




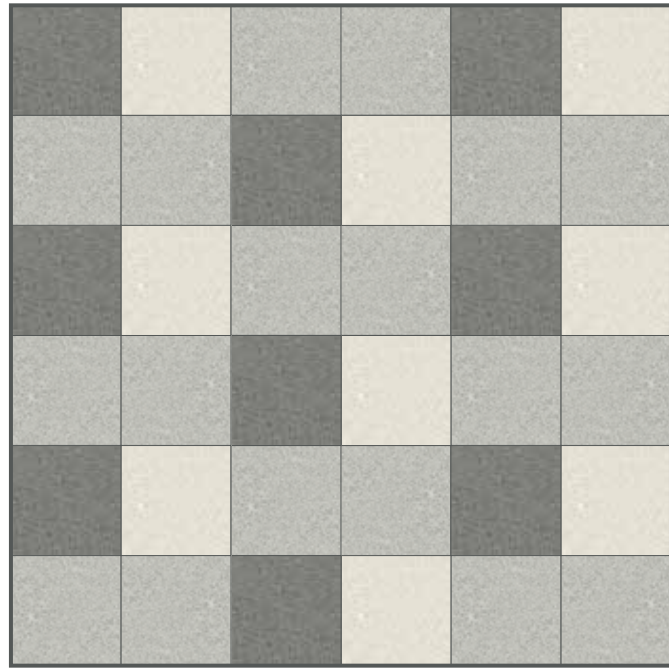
100%



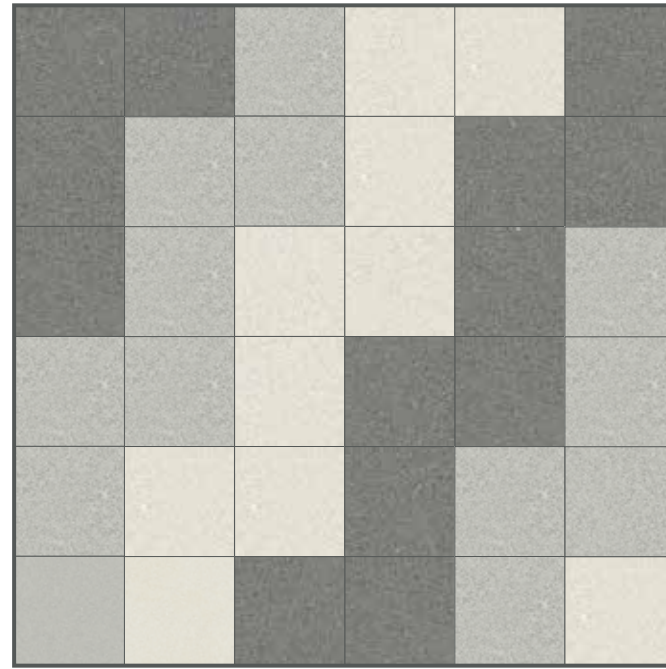
MONOCROMATICA

INSTALLATION TIPS

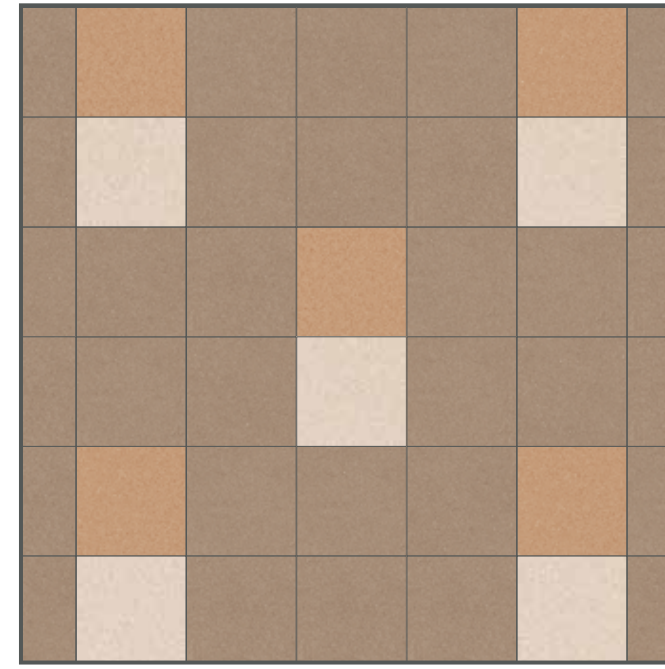
 3/4" thickness



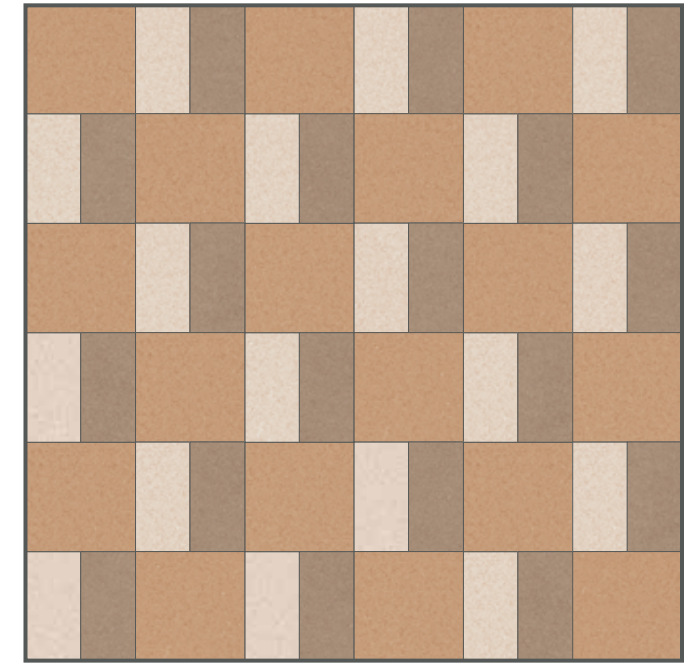
BONE $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 ASH $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 BASALT $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



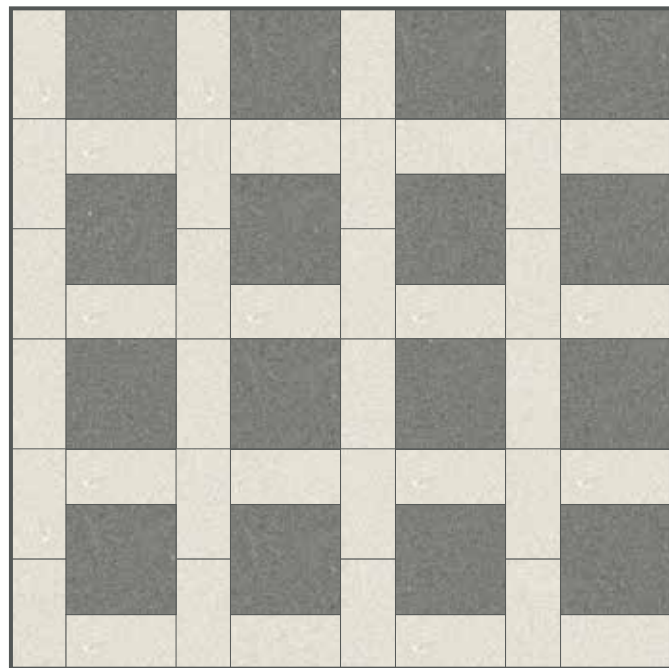
BONE $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 ASH $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 BASALT $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



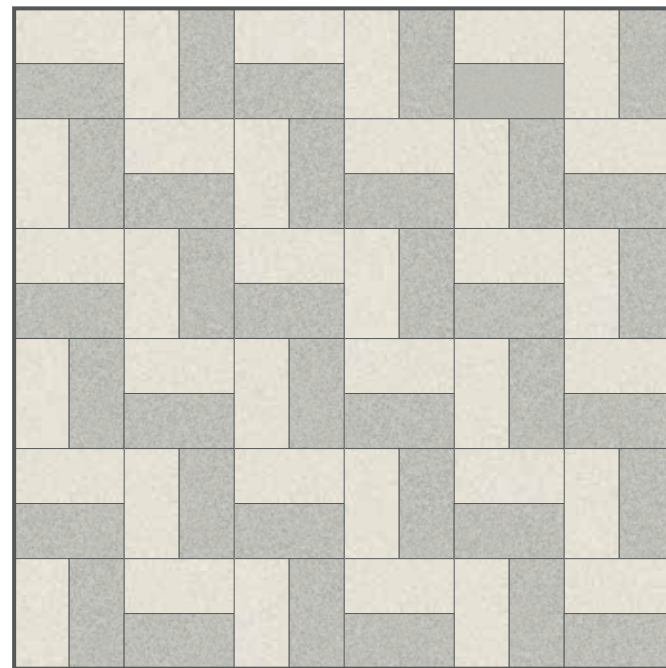
SAND $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 LEATHER $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 COGNAC $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



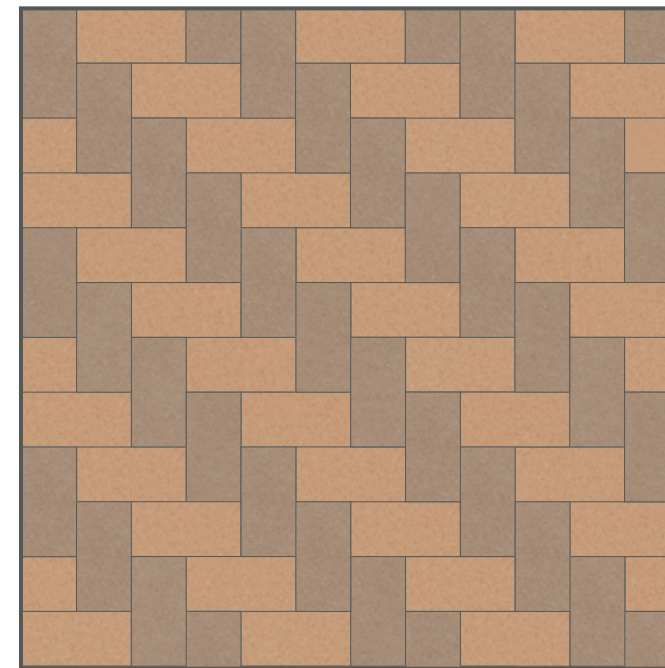
SAND $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 LEATHER $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 COGNAC $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



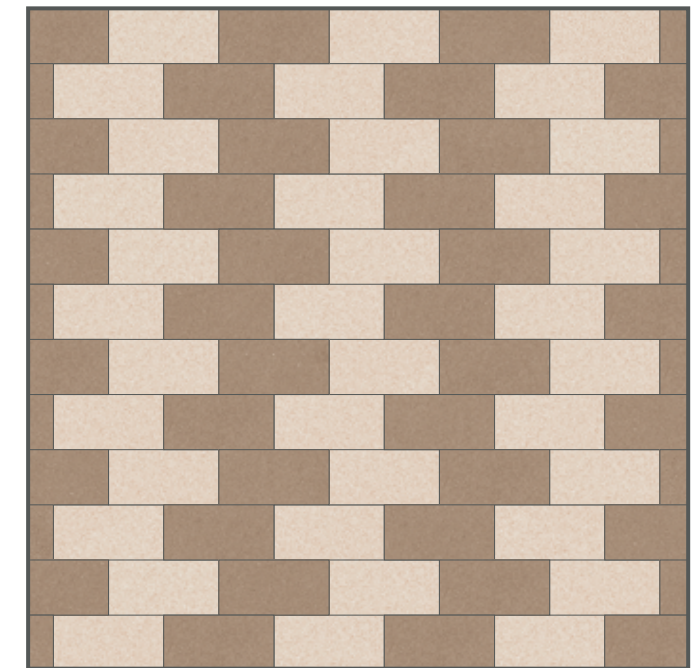
BONE $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 BASALT $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



BONE $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 ASH $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm



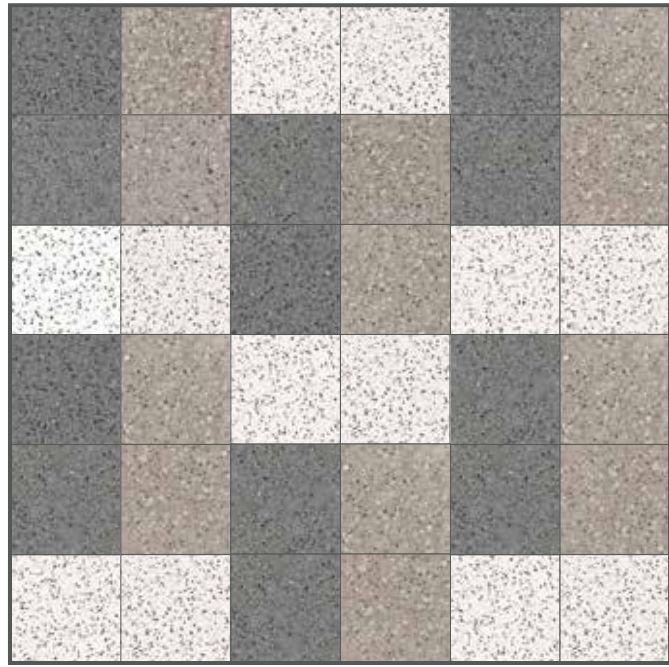
LEATHER $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 COGNAC $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm



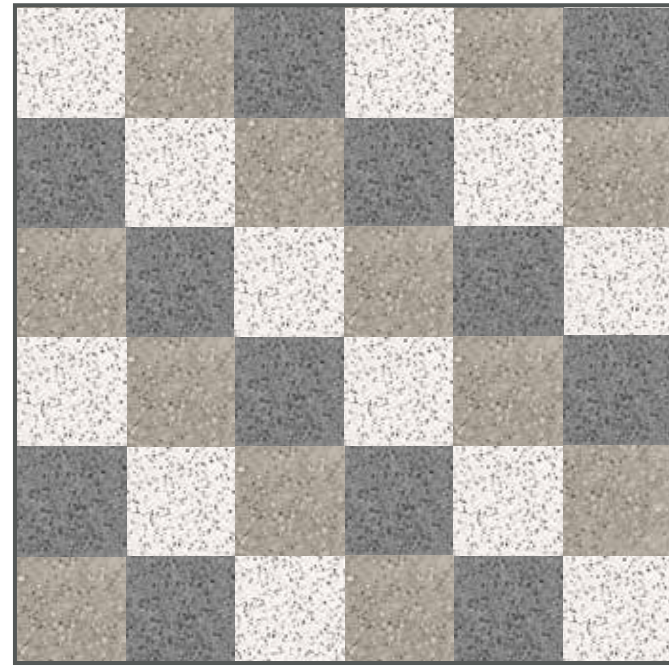
SAND $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 COGNAC $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm

TERRAZZO

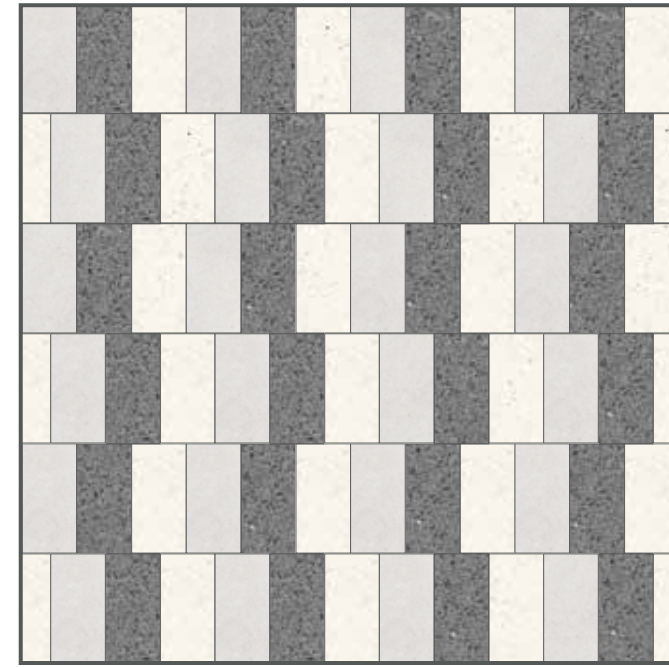
INSTALLATION TIPS



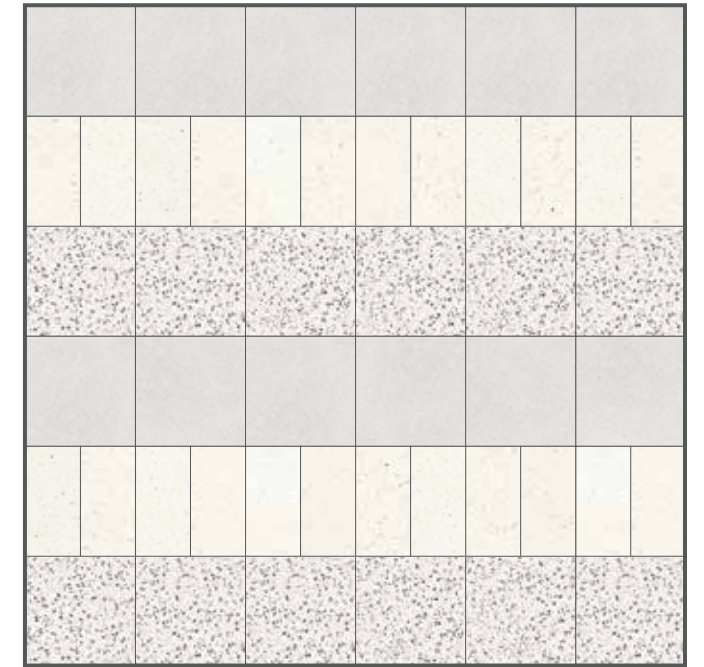
WHITE BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
GREY BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
CHARCOAL	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



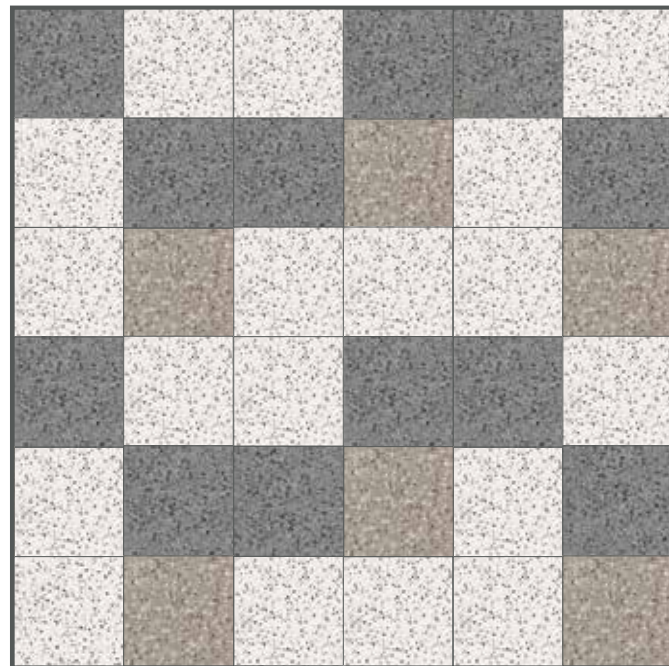
WHITE BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
GREY BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
CHARCOAL	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



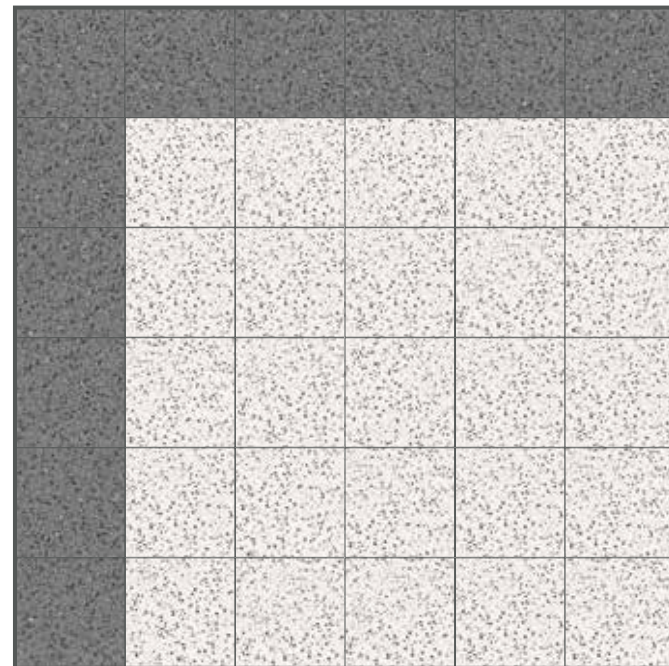
COOL WHITE	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
COOL GREY	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
CHARCOAL	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm



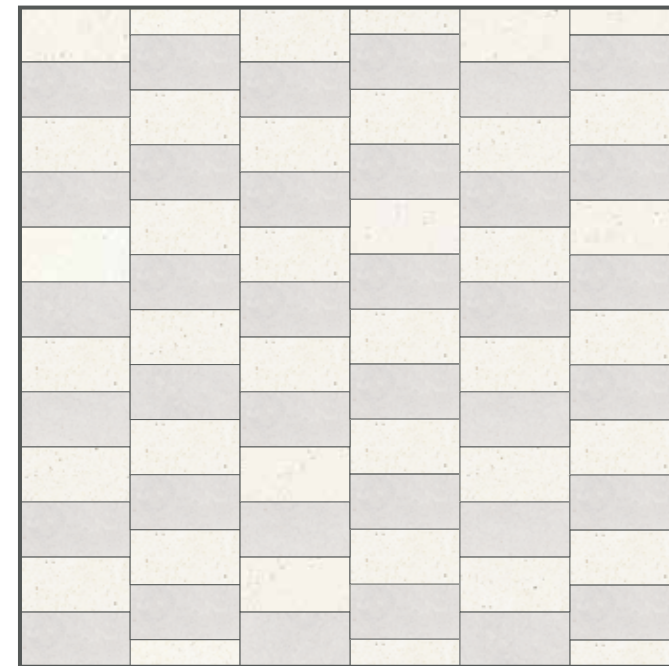
COOL GREY	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
COOL WHITE	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
WHITE BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



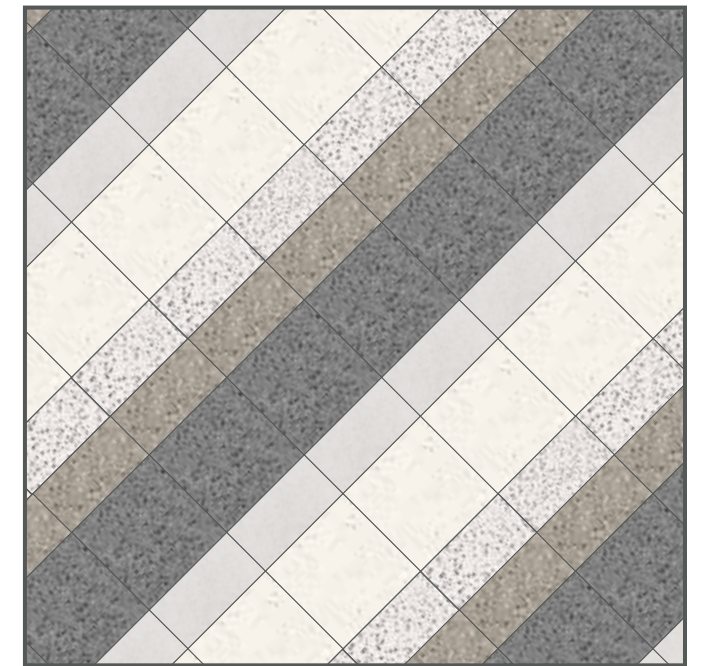
WHITE BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
GREY BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
CHARCOAL	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



CHARCOAL	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
WHITE BLACK	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



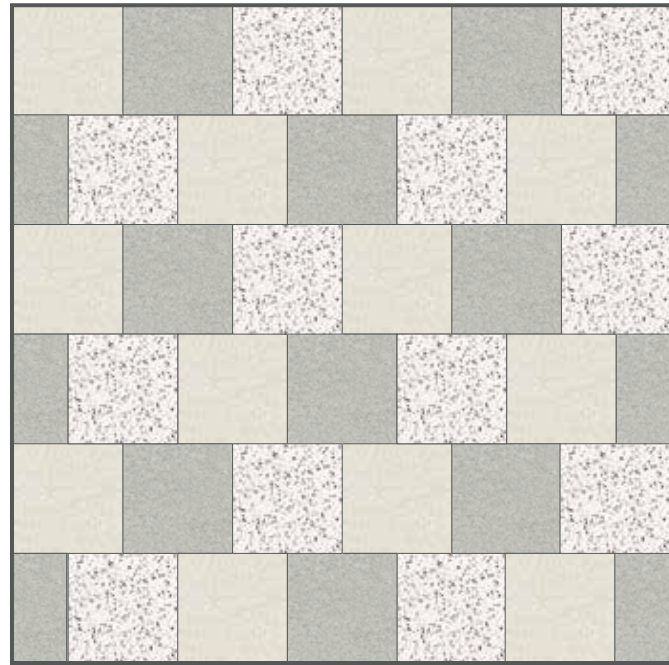
COOL WHITE	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
COOL GREY	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm



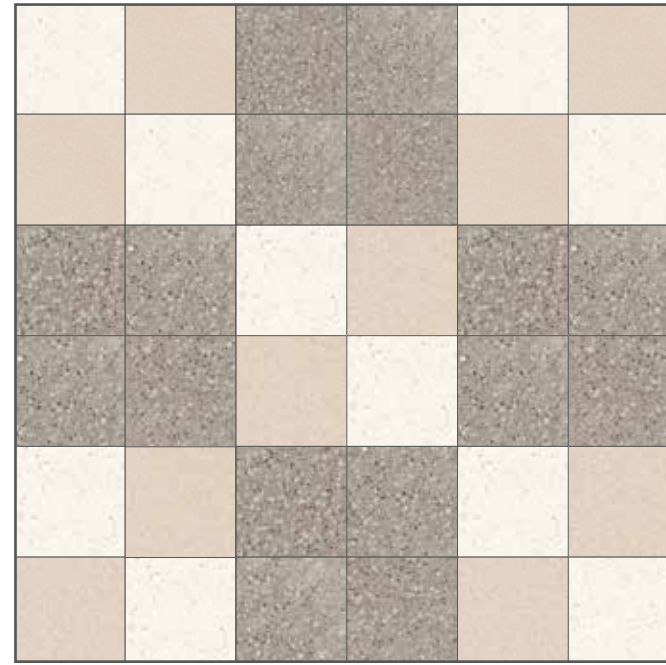
WHITE BLACK	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
GREY BLACK	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
COOL WHITE	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
CHARCOAL	$23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
COOL GREY	$11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm

MONOCROMATICA + TERRAZZO

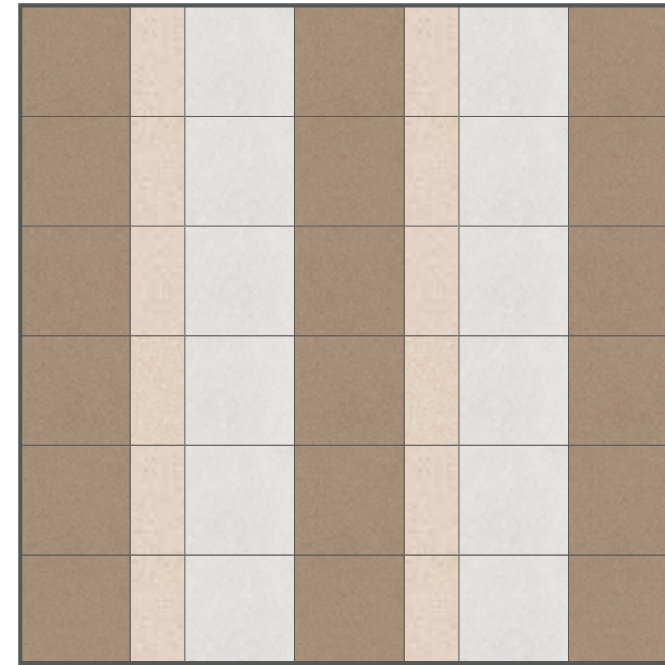
INSTALLATION TIPS



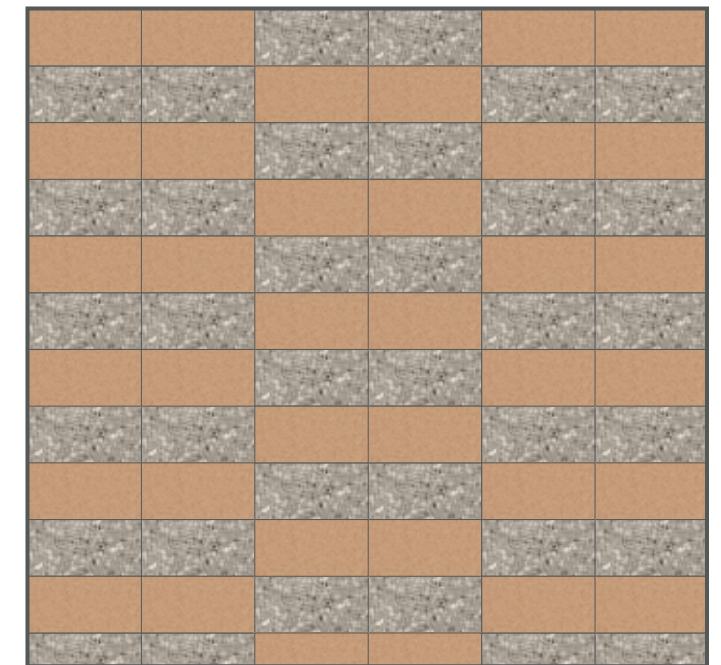
MONOCROMATICA BONE $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 MONOCROMATICA ASH $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 TERRAZZO WHITE BLACK $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



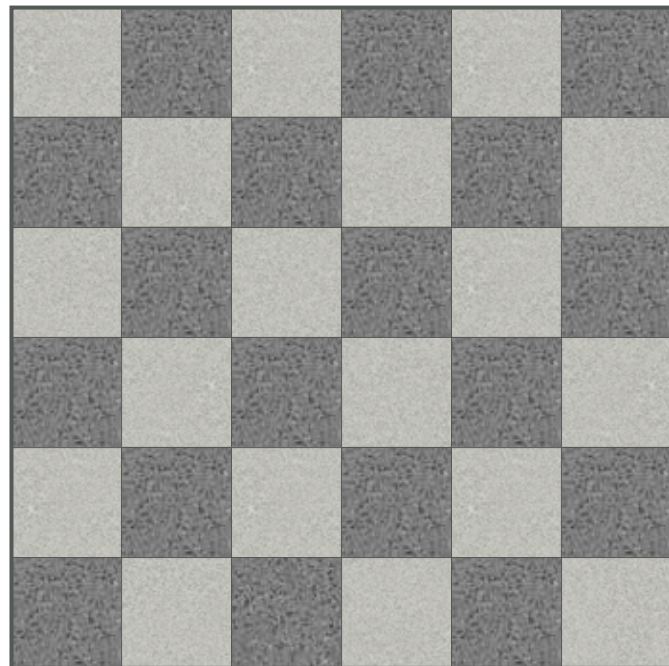
MONOCROMATICA SAND $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 TERRAZZO GREY BLACK $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 TERRAZZO COOL WHITE $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



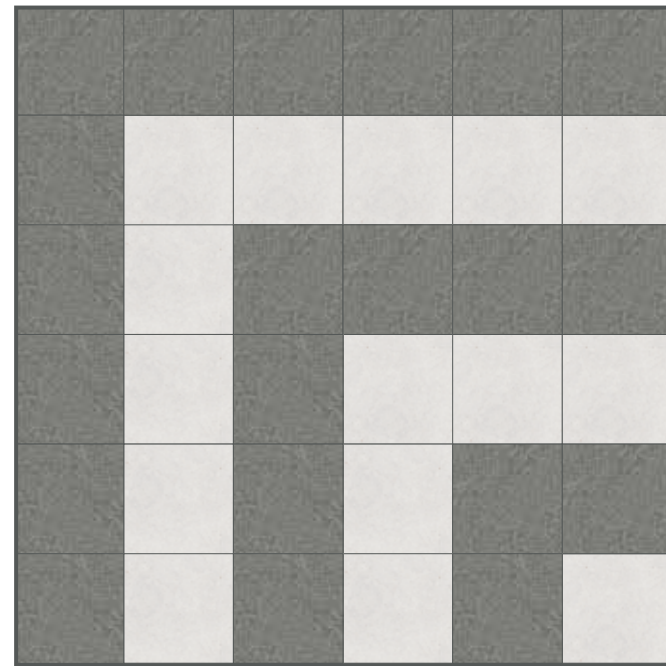
MONOCROMATICA SAND $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 MONOCROMATICA LEATHER $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 TERRAZZO COOL GREY $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



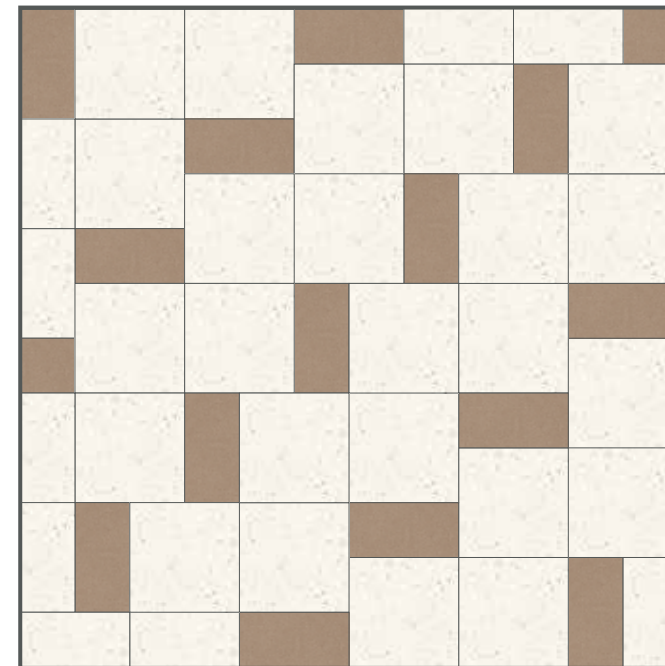
MONOCROMATICA COGNAC $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 TERRAZZO GREY BLACK $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm



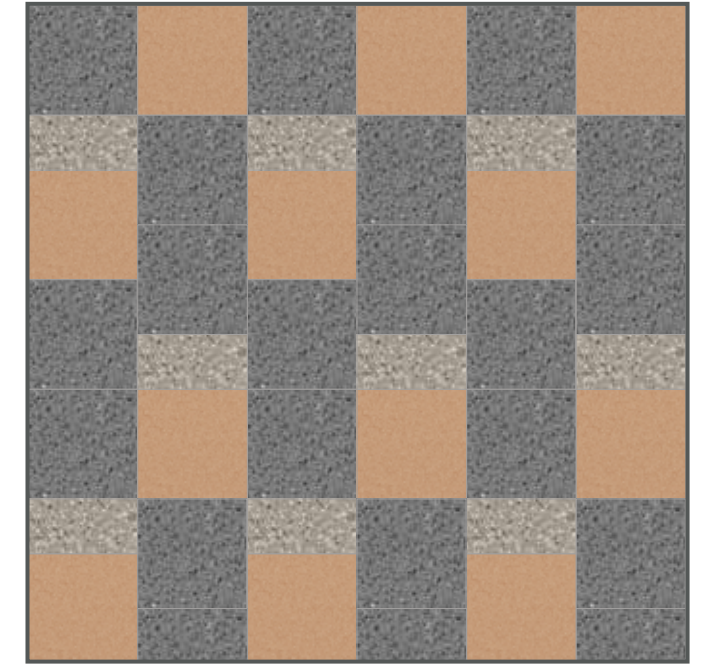
MONOCROMATICA ASH $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 TERRAZZO CHARCOAL $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



MONOCROMATICA BASALT $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 TERRAZZO COOL GREY $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



MONOCROMATICA LEATHER $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 TERRAZZO COOL WHITE $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm



MONOCROMATICA COGNAC $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm
 TERRAZZO GREY BLACK $11\frac{3}{4}'' \times 23\frac{1}{2}''$ - 30x60 cm
 TERRAZZO CHARCOAL $23\frac{1}{2}'' \times 23\frac{1}{2}''$ - 60x60 cm

THE HEAT ISLAND EFFECT

Urban areas are usually warmer than their rural surroundings, due to a phenomenon known as the “heat island effect.”

Cities development involves the decrease of vegetation areas in favor of the urban backgrounds, where the surfaces are paved or covered with build-ings, the change in ground cover results in less shade and moisture to keep urban areas cool. Built-up areas tend to evaporate less water, which contributes to elevate surface and air temperatures. Several properties of urban materials, in particular solar reflectance, thermal emissivity, and heat capacity, also influence the development of urban heat islands, as they determine how the sun’s energy is reflected, emitted, and absorbed.

Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, as well as heat-related illness and mortality, and water quality.

Lawrence Berkley National Laboratories (LBNL), which has performed extensive research on the heat island effect in urban areas, has established that the probability of smog creation rises 5 percent for each one-half degree increase above 70°F. While LBNL has concluded that reduced vegetation accounts for the largest percentage of urban heat islands at 56 percent, dark roofing surfaces run a strong second at 38 percent. The USGBC has addressed the heat island effect in regard to both roofing surfaces and other large, typically paved areas in its LEED guidelines.

WHAT IS THE SOLAR REFLECTANCE INDEX?

In October 2005, the USGBC released new guidelines for LEED credits. The New Construction Version 2.2 revised the values required for mitigating the heat island effect.

The guidelines are now based on the Solar Reflectance Index (SRI) of specified materials as calculated by ASTM E 1980.

EMITTANCE –

The emittance of a material refers to its ability to release absorbed heat. Scientists use a number between 0 and 1 to express emittance.

With the exception of metals, most construction materials have emittances above 0.85.

SOLAR REFLECTANCE –

Also known as albedo, is the ratio of the amount of solar radiation reflected from a surface to the total amount reaching that surface (which includes visible and ultraviolet light and infrared radiation).

SOLAR REFLECTANCE INDEX (SRI) –

SRI is a value that incorporates both solar reflectance and emittance in a single value to represent a material’s temperature in the sun. SRI quantify es how hot a surface would get relative to standard black and standard white surfaces.

It is calculated using equations based on previously measured values of solar reflectance and emittance as laid out in the American Society for Testing and Materials Standard E 1980.



WHAT SRI VALUES DO BUILDING MATERIALS NEED FOR LEED?

As shown in Table 1, the minimum SRI for cool roofing has increased in the newer LEED v4. In the earlier LEED 2009 requirements, cool roofing did not consider age. SRI as an option for qualification.

Projects seeking LEED v4 have the option of qualifying using either initial SRI or by obtaining the 3-year aged SRI value.

TABLE 1. Minimum SRI for Cool Roof Materials in LEED 2009 vs. LEED V4

		Slope	Initial SRI	3 year aged SRI
LEED 2009	Low sloped roof	≤ 2:12	78	-
	Steep-sloped roof	> 2:12	29	-
	Parking Cover	-	29	-
LEED V4	Low sloped roof	≤ 2:12	82	64
	Steep-sloped roof	> 2:12	39	32
	Parking Cover	-	39	32

The impact of hardscape such as roads, sidewalks, courtyards, and parking lots is an important element in earning the Heat Island reduction credit. Table 2 shows the requirements for hardscape and shade providing architectural devices and structures. In LEED version 4, paving materials require documentation for Solar Reflectance only, not the SRI asked for in LEED 2009.

TABLE 2. Minimum Solar Reflectance for Hardscape in LEED 2009 vs. LEED V4

	Metric	Initial	3 year aged SRI
LEED 2009	Solar Reflectance Index	29	-
LEED V4	Solar Reflectance	0.33	0.28

CONCRETE KRONOS USA	Color Group	SRI value	LEED Credit	R AVG	EM AVG
Terrazzo Cool White	WLG	84	Passed	0,682	0,8920
Monocromatica Bone	WLG	78	Passed	0,640	0,910
Monocromatica Sand	ST	74	Passed	0,608	0,930
Terrazzo Cool Grey	LMG	72	Passed	0,600	0,890
Terrazzo White Black	WLG	69	Passed	0,576	0,900
Terrazzo Grey Black	ST	58	Passed	0,500	0,880
Monocromatica Ash	LMG	56	Passed	0,459	0,900
Monocromatica Cognac	RB	42	Passed	0,383	0,850
Monocromatica Leather	DB	41	Passed	0,370	0,890
Monocromatica Basalt	DGG	35	Passed	0,310	0,950
Terrazzo Charcoal	DGG	30	Passed	0,297	0,870

CERTIFICATION LETTERS FOR LEEDS PROJECTS

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. In accordance with LEED Rating System and UNI EN ISO 14021:2016 Environmental labels and declarations - (Type II environmental labelling), declares that:

MR - Material & Resources Building Product Disclosure and Optimization	Recycled Content (% Pre-consumer)	Kronos USA products are produced with 35% of pre-consumer recycled materials
	Regional Materials (% Respect factory)	These Credits are applicable for buildings constructed within 500 miles (804.5 km) from the factory. The 49% of whole Kronos USA raw materials are quarried in the 500 miles radius. Therefore Kronos USA products contribute for 49% of their value to the LEED Credits of this Section.
	Sustainability Resort	Available self-declared Corporate Sustainability Report (CSR) conform to Global Reporting Initiative (GRI) Sustainability Report
	Environmental Product Declaration	Available industry-wide Environmental Product Declaration (EPD) conform to 18014025
	Material Ingredients	Available Health Product Declaration (HPD) in compliance with the Health Product Declaration open Standard
	Waste Management	All packaging material are fully recyclable and reusable. The material coming from the demolition of the tiles is “inert” material that can be recycled
EQ - Indoor Environmental Quality	Low emitting materials	No traces of VOC (Volatile Organic Compounds) are present in Kronos USA tiles (as certified by the external labs in charge of the tests).
SS Sustainable Sites	Heat Island Effect	The great majority of Kronos USA 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 ≥ 32:
EA - Energy & Atmosphere	Energy Performance (Conductivity (λ))	1,0 - 1,3 W/mK
IN - Innovation	-	Kronos USA 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: <ul style="list-style-type: none"> • safeguard of the environment; • continuous improvement of the environmental performances of Kronos USA products and manufacturing sites; • healthcare of Kronos Usa workers and customers.

COOL ROOFS

Cool roofs use highly reflective materials to reflect more light and absorb less heat from sunlight, which keeps homes cooler during hot weather.

A cool roof is one that has been designed to reflect more sunlight and absorb less heat than a standard roof.

Standard or dark roofs can reach temperatures of 150°F or more during the summer. A cool roof under the same conditions could stay more than 50°F cooler and save energy and money by using less air conditioning.

BENEFITS OF COOL ROOFS

A cool roof can benefit a building and its occupants by:

- Reducing energy bills by decreasing air conditioning needs
- Improving indoor comfort for spaces that are not air conditioned, such as garages or covered patios
- Decreasing roof temperature, which may extend roof service life.

Beyond the building itself, cool roofs can also benefit the environment, especially when many buildings in a community have them.

Cool roofs can:

- Reduce local air temperatures (sometimes referred to as the urban heat island effect)
- Lower peak electricity demand, which can help prevent power outages
- Reduce power plant emissions, including carbon dioxide, sulfur dioxide, nitrous oxides, and mercury, by reducing cooling energy use in buildings.

POPA 2.0 | 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
ASTM - C 648	Breaking Strength Modulus of Rupture	> = 250 lbf Average	> = 2250 lbf Individual
ISO - 10545-4	Bending strength in N (thickness > = 7.5 mm)	> = 1300 Newton	> 13000 N - 7000 psi
ISO - 10545-5	Impact resistance	-	0.88
EN 12825	Static load	-	Centre 9.6 Kn - > 1700 lbf Centre point of sides 6.5 Kn - > 1200lbf Diagonal 8.19 Kn (CLASSE 3) - >1500 lbf
	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 - 3232 lbf	classe 14
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	-	$\alpha=6.3 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$
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
* TAS 108 FLORIDA BUILDING CODE WIND UP LIFT TEST	3/4" thick 24"x24" porcelain installed on fixed height pedestals and 45° wind angle was blow of at	-	130 mph with no parapet 150 mpt with 12" high parapet

POPA 2.0 | PACKAGING

2.0 MONOLITHIC RECTIFIED CERAMIC TILE	Thickness	Unit / Box	SqFt / Box	Boxes / Pallet	SqFt / Pallet	Weight / Box	Weight / M ²	Weight / SqFt	Weight / Pallet (included)	Pallet Size
23½"x23½"	3/4" - 20mm	2	7.75	36	279	72 lb	100 lb	9,3 lb	2670 lb	42"x 42"
11¾"x23½"	3/4" - 20mm	4	7.75	40	310	72 lb	100 lb	9,3 lb	2955 lb	42"x42"



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