

QUA
GRANITE



CERAMIC TILE PRODUCT GUIDE

TECHNICAL INFORMATION | APPLICATION | CARE



excellence in ceramics

CONTENTS

1. GENERAL INFORMATION ABOUT CERAMIC TILES	3
1.1 Standards and Classification	3
1.2 QUA Granite Tile Description - Terms and Explanations	4
1.2.1 Mass (Body)	4
1.2.2 Engobe	4
1.2.3 Glaze	4
1.3 Change of Color and Pattern (Class V)	5
1.4 Resistance to Surface Scratch and MOHS Hardness Scale	6
1.5 Resistance to Surface Abrasion - PEI Class	7
1.6 Tile Resistant to Slip (Antislip Surface)	8
2. SELECTION OF APPROPRIATE TILE	9
2.1 Recommendations for Selecting Products according to Body Properties	9
2.1.1 Wall Tiles	9
2.1.2 Floor Tiles	9
2.1.3 Glazed Porcelain Tiles	9
2.2 Recommendations for Selecting Products according to Thickness	9
2.2.1 7mm-6.5mm Porcelain Tiles	9
2.2.2 8mm-9mm Porcelain Tiles	9
2.2.3 20mm and 30mm Porcelain Tiles	9
2.3 Recommendations for Selecting Products according to Surface Properties	10
2.3.1 Glossy Glazed and Full Lappato Surface Products	10
2.3.2 Lappato Surface Products	10
2.3.3 Matte-Granular Matt-Protection Matt and Other Special Products	10
3. APPLICATION METHODS AND INFORMATION FOR USE	11
3.1 Safety First	11
3.2 Application Stages	12
3.2.1 Preparation	12
3.2.2 Application and Adhesion on the Ground	17
3.2.3 Instructions and Recommendations for Mounting of 20mm and 30mm Tiles on Elevated Ground	21
3.2.4 Instructions for Project Engineers and Customers regarding Application of 20mm and 30mm Porcelains on Elevated Ground	22
3.2.5 Pedestal Calculation and Usage Advice in Raised Floor Applications	23

4. CLEANING AND MAINTENANCE DURING AND AFTER APPLICATION	25
4.1 Cleaning and Maintenance for Porcelain Surfaces After Application	25
4.2 Maintenance of Products with Matte - Antislip and Rough Surfaces	25
5. CLEANING AND MAINTENANCE IN ROUTINE USE - PREVENTION OF DIRTS AND SCRATCHES	26
5.1 General Maintenance of Porcelain Tile Products with Matte and Polished Surface	26
5.2 Maintenance of Metallic Glazed Tile	26
5.3 Maintenance of Grouting Material	27
5.4 Spotter and Recommended Cleaning Agents	27
6. TECHNICAL INSPECTION, METHODS FOR COMPLAINTS	28
7. CRADLE TO GRAVE LIFE CYCLE IN QUA GRANITE PORCELAIN TILES	29
8. QUA GRANITE WARRANTY CERTIFICATE	31

1

GENERAL INFORMATION ABOUT CERAMIC TILES

1.1 Standards and Classification

According to the expression published by the European Committee for Standardization (CEN - the European Committee for Standardization); The mixtures obtained from clay and/or other inorganic raw materials by different mixing and grinding processes are formed by extrusion (Method A) or dry pressing (Method B) process at room temperature and then dried. These products are fired at a temperature sufficient to provide the required properties are so get a name ceramic materials. These ceramic products can be glazed (GL) or unglazed (UGL). Ceramics can be created with other techniques outside the scope of the European standard, these are out of our scope.

According to the TS EN 14411 Ceramic Tiles-Recipes, classification, features, conformity assessment and marking standard, accepted and implemented by the Turkish standards institute prepared and published in CEN, ceramic tiles are divided into various groups according to their production method and water absorption feature:

Table 1

Shaping	Water Absorption Capacity (E_b)			
	Group I $E_b \leq \% 3$	Group II _a $\%3 < E_b \leq \% 6$	Group II _b $\%6 < E_b \leq \% 10$	Group III $E_b > \% 10$
A Tiling Method	Group AI _a $E_b \leq \% 0,5$ (Annex L)	Group AII _{a-1^a} (Annex B)	Group AII _{b-1^a} (Annex D)	Group AIII (Annex F)
	Group AI _b $\% 0,5 < E_b \leq \% 3$ (Annex A)	Group AII _{a-2^a} (Annex C)	Group AII _{b-2^a} (Annex E)	
B Dry Pressing Method	Group BI _a $E_b \leq \% 0,5$ (Annex G)	Group BII _a (Annex I)	Group BII _b (Annex J)	Group BIII _b (Annex K)
	Group BI _b $\% 0,5 < E_b \leq \% 3$ (Annex H)			

- Groups AI_a and AI_b are divided into two parts with different product characteristics (Part 1 and Part 2).
- Group BIII covers only glazed tiles. There are also unglazed tiles, which are not included in this product group, albeit in small quantities, with a water absorption of more than 10% and produced by the dry pressing method.

1.2 QUA Granite Tile Description - Terms and Explanations

PORCELAIN CERAMIC TILE; It is called fully glazed (vitrified) ceramic tile with a water absorption capacity of 0.5% or less. (See Ala and Bla groups in Table1.)

As QUA GRANIT, our company;

- We produce porcelain tiles in 6.5 mm, 7 mm, 9 mm, 20 mm and 30 mm thicknesses and different sizes.

All of these products;

- It is in Group Bla Eb \leq 0.5% (Annex G) product group with low water absorption.
- It is produced as glazed (GL – Glazed).
- After it is produced, the box is rectified in a single dimension specified on them and in the technical reports and micro chamfer is applied and there is no different caliber class.

1.2.1 MASS (Body)

The mixtures obtained from clay and/or other inorganic raw materials are formed into moist granules in a spray dryer after different mixing and grinding processes, and are shaped and dried by dry pressing in the form of falt plates (Method B). We use the term ceramic tile body for the dried raw ceramic plate formed here. As Qua Granit, we have body productions in product-specific mixtures and colors.

- T1 colorless body
- G1 low amount black body mixed
- G2 high amount black body mixed
- B1 low amount Brown body mixed
- B2 high amount Brown body mixed

We make our productions by using the appropriate bodies for the product top image by coding in the form.

1.2.2 Engobe

It is a coating material that gives the clay-based, permeable or impermeable, matte-looking product the technical properties it needs, and is an intermediate layer that provides bonding by being applied between the glaze and the body. Different mixtures and application methods are used for our products.

1.2.3 Glaze

It is the impermeable coating on the ceramic tile. Matte, glossy, and varieties that offer different visual, physical and features are developed specifically for the products.

Full Polished - Completely Polished Surface

It is the surface that gives full glossy glassy appearance to glazed ceramic tiles by mechanical polishing after firing.

Lappato - Partially Polished Surface

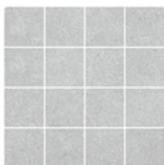
The process of partial polishing of the products with special surface coating materials (glaze, granule, metallic, luster, glossy and various other types that can be developed) with mechanical polishing after firing.

Matte - Granular Matt-Protection Matt and Other Special Surface Products

They are products that do not undergo any further processing on glazed ceramic tile surfaces after firing. It can be produced in different surface textures and physical properties according to the glaze and other top materials applied.

1.3 Change of Color and Pattern (Class V)

It is the parameter that classifies whether the product's internal design is homogeneous or variable. If the design consists of homogeneous and uniform or very similar colors and patterns, it is classified as V1 and the V value increases as the variations in design and color increase, similar to the differences in the description and images below:

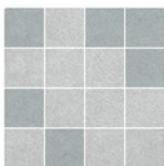


V1 Low

Differences in pattern and color tone are at a very low level.

Uniform Appearance:

Differences among pieces from the same production run are minimal.



V2 Middle

Differences in pattern and color tone are at medium level.

Slight Variation:

Such products have similar tones in surface texture or colors, but they are designed to have clearly distinguishable differences.



V3 High

Differences in pattern and color tone are at high level.

Moderate Variation:

While the colors present on a single piece of tile will be indicative of the colors to be expected on the other tiles, the amount of colors on each piece may vary significantly. For example "that little bit of color" on one piece of tile may be the primary color on the next piece.



V3 Variable

Differences in pattern and color tone are at the top level.

Substantial Variation:

The color shade or shades of all tile are designed to vary some degree from piece to piece, from each production run to run. At least several pieces from the same production run should be reviewed whenever possible to determine acceptable color shade variations. Thus the final installation will have a unique blend of tiles.

1.4 Resistance to Surface Scratch and MOHS Hardness Scale

As the name implies, hardness refers to hardness of a mineral. Strength is the resistance of mineral to pressures and forces acting on the mineral. Hardness is related to chemical structure of mineral and bond established among minerals. The more and tighter the bonds are, the harder that mineral is.

Hardness is generally measured with reaction to the force of scratch. Friedrich Mohs detected which mineral is harder as a result of scratches remaining on minerals when he grinded them together. He noticed the harder mineral scratched the less hard one. As a result of this, he suggested that minerals hardness of which is not known can be interpreted by using materials hardness of which is known. Then, Mohs created the Hardness Scale. Resistance of ceramic tiles to surface scratches is classified with this scale.

Mohs Hardness Scale		
Name of Rock/Mineral	Hardness Degree	Scratch Test
Talk	1	nails can scratch
Gypsum	2	nails or a pocket knife and a needle can scratch
Calcite	3	a pocket knife and a needle can scratch
Fluorite	4	a pocket knife and a needle can scratch
Apatite	5	rasp can scratch
Feldspar	6	rasp can scratch
Quartz	7	Those who scratch glass strongly
Topaz	8	Those who scratch glass strongly
Corindum	9	Those who scratch glass strongly
Diamond	10	Only those drawn with a very powerful laser



1.5 Resistance to Surface Abrasion - PEI Class

Resistance of glazed tiles that are used for coating grounds to surface abrasion is determined after products are subject to test numbered EN ISO 10545-7 as specified in European norms and relevant results are classified for PEI according to description. According to PEI surface abrasion class provided below, recommendations for use should not be considered correct product properties are provided for certain requirements, these recommendations should be used as a guidance only. This classification is applied for applications under normal conditions. Shoes, traffic type and cleaning methods must be considered in selection of tiles and grounds must be protected from scratching stains with sole cleaning tool to be placed at the entrance areas of buildings. For severe conditions such as intense amount of scratcher and traffic; matte, harder and less-patterned products with high PEI class that make abrasions less visible and are suitable for body color must be preferred.

• PEI 0

It is not recommended to use glazed tiles in this class as ground covering.

• PEI 1

Tiles that can be used as floor coverings in places that do not contain dirt that causes scratching, with soft-soled shoes or in places where one will walk around barefoot (for example, in houses, bathrooms and bedrooms without any direct entrance from the outside).

• PEI 2

Tiles that can be used as floor coverings in places where you will be wandering most occasionally with soft-soled or normal-soled shoes that contain a certain amount of dirt that causes scratching (for example, kitchens in homes, living rooms outside the hallway and other areas with heavy traffic). This does not apply to shoes other than normal shoes, such as boots with spiked soles.

• PEI 3

Tiles that can be used as floor coverings in places where people walk more frequently (for example, in kitchens, corridors, halls, balconies and terraces) with normal-soled shoes containing a certain amount of dirt that causes scratching. It is not suitable for areas where normal shoes with scratching properties are used, such as shoes with spiked soles.

• PEI 4

Tiles that can be used as floor coverings with shoes containing a certain amount of dirt causing scratching and in places exposed to normal pedestrian traffic under conditions more severe than those specified in Class 3 (for example, entrances, commercial kitchens, hotels, exhibition and sales rooms).

• PEI 5

It can be used as a floor covering in places that are exposed to heavy pedestrian traffic for a long time (for example, shopping malls, airports, hotel entrances, pedestrian pavements and public areas such as industrial applications) with shoes containing dirt that causes scratching tiles.

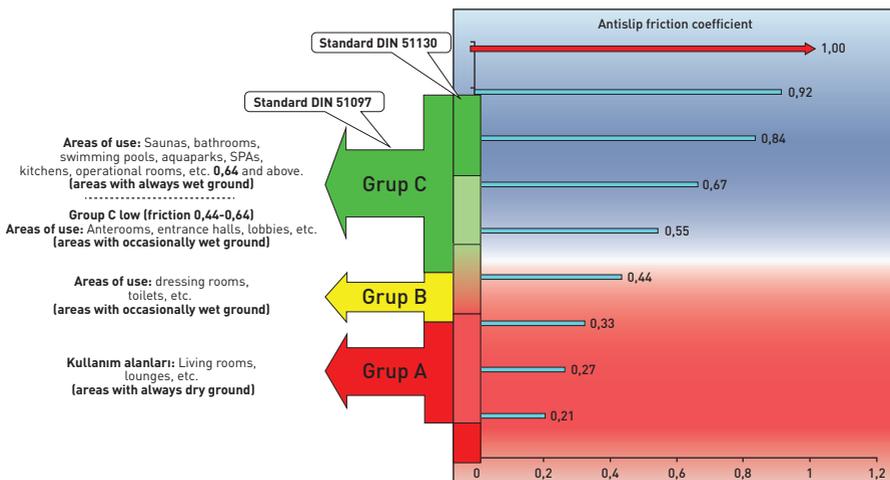
1.6 Tile Resistant to Slip (Antislip Surface)

In order to give extra non-slip properties to products such as matte, wood, concrete surface that are not processed after firing, technological materials that give this feature are also applied on the products during glaze applications. The anti-slip class of the product is determined according to different standard tests according to different usage needs.

- When it is necessary to use in heavy traffic and industrial facilities, standard oil is applied on the tiles according to DIN 51130 test and a fixed weighted individual with special shoes is walked to find the slip angle. According to this test, the product is classified from the minimum lower limit R9 to the most slip resistant value R13.
- For tiles that will be used in wet areas with less traffic, the tiles are wetted with water in accordance with DIN 51097 test, and the slope that the barefoot person slides on is determined. According to this test, the products are min. It is classified from limit A to upper limit C.
- If desired, product slip class can be determined with different test methods such as ANSI Dynamic friction and ASTM Static friction coefficients.

Comparisons of these mentioned test results are summarized in Diagram 1 by SSI. HSE (Health and safety Executive) <https://www.hse.gov.uk/pubns/geis2.pdf> page explains all current anti-slip measurements.

DIN STANDARDS ANTISLIP FRICTION COEFFICIENT



2 SELECTION OF APPROPRIATE TILE

You may be bored of a lot options while looking for ceramic tile. However, you can narrow your search after you understand how tiles are grouped and which types are most suitable for your needs.

2.1 Recommendations for Selecting Products according to Body Properties

2.1.1 Wall Tiles

These tiles can only be used on walls of internal areas due to water absorption capacity at 10-20% and low load-carrying capacity as given in the Table 1. They are preferred for internal walls since they are light in weight and provide quiet rich visual features. They can be used with the first-day quality for long years with application with proper adhesives. They can easily crack since they cannot resist water (changes in hot-cold weather) and loads when used on grounds and external areas.

2.1.2 Floor Tiles

They are preferred for internal grounds and walls due to maximum water absorption capacity at 3,0% as given in the Table 1.

2.1.3 Glazed Porcelain Tiles

Due to its maximum 0.5% water absorption and superior bending strength capacity given in Table 1, it can be used indoors and outdoors both as a floor, wall coverings and as an exterior cladding. QUA GRANITE Porcelain tile products, on the other hand, are produced under 0.1% water absorption rate by lowering their limits.

2.2 Recommendations for Selecting Products according to Thickness

2.2.1 7mm-6.5mm Porcelain Tiles

In addition to satisfying all the porcelain tile features, by being lighter in weight, they are preferred in interior and exterior wall coverings, floor coverings, pool interiors. With very smooth sub-base applications leveled in accordance with the conditions of the usage area they can also be used easily on indoor and outdoor floors.

2.2.2 8mm-9mm Porcelain Tiles

QUA GRANITE porcelain tiles can be used safely in all areas where ceramic tile coating is planned (indoors, outdoors, on the floor and on the walls. Since it also provides low water absorption, frost resistance and superior strength properties), it is used in exterior cladding, inside pools, outdoor areas such as garden terraces, buildings. coatings are also one of the reasons why they are preferred, they can be used without any problems.

2.2.3 20mm and 30mm Porcelain Tiles

Traditionally, these tiles are preferred mostly on grounds bearing heavy load if they are adhered on the surface. In addition, they can be applied directly on grass, gravel and sand surfaces by fixing the tiles and on elevated grounds in offices and workplaces with appropriate plastic apparatus. We produce this group of products in min. R10 antislip class. Therefore, they can be used securely on areas such as gardens, terraces, pool sides, wet walking paths, etc.

2.3 Recommendations for Selecting Products According to Surface Properties

Suggestions for product groups are generally made by evaluating their technical features. For the ceramics to be applied to the floor, the wear and scratch surface properties should be taken into consideration depending on the use of the space and the appropriate product selection should be made. In case of uncertainty, our sales representative can be contacted and information about alternatives can be obtained for the most appropriate selection.

Our company defines the surface feature of products with 15 digit material code system in which the 14th digit explains the product surface property. For example, in the material code S04MD433D1X10M0, the product surface is described with a letter M as protection mat glazed surface. The most fundamental differences from these definitions are given below, different special surface applications are also available and constantly being developed:

- C Matt Glazed
- E Lappato
- F Full Lappato
- G Granular Matte
- M Protection Matt Glazed
- Z Glossy Glazed

2.3.1 Glossy Glazed and Full Lappato Surface Products

In indoor use, floor and wall can be applied for any area, they add extra sparkle, shine and depth to the environment where they are applied. Since products with glossy surfaces will become slippery when wet, if they are to be used in more general places with the potential to get wet, they should be used with non-slip mats and necessary precautions should be taken. It should not be used in outdoor areas where human traffic is heavy, as there will be a risk of scratching with stone, soil, sand residues and slipping due to getting wet.

During the application, the surfaces should be kept clean and protected from scratching, and should be protected by covering when necessary. Joint residues and mortar residues should be cleaned before they dry, and it should not be walked around with sandy residues on it.

2.3.2 Lappato Surface Products

The surfaces of these products have a special texture and add extra sparkle to the environment according to the lighting of the environment. Thanks to the special coating material used on the surfaces, it is in the group of especially scratch-resistant products. Although the risk of slipping is very low when dry, it will become slippery when it is wet. It is recommended to clean the liquid contaminants that will occur in use due to the rough texture on the surface, as it will provide the fastest cleaning.

The surfaces of QUA GRANITE products are resistant to staining, and when necessary, hard-dry stains that remain with residue for a long time can be cleaned without damaging the surface with the appropriate cleaning materials described in this booklet. In case of contradiction, it is recommended to contact our technical service.

2.3.3 Matte-Granular Matt-Protection Matt and Other Special Products

It is the type of surface that can be recommended for any area, indoors, outdoors, at home or in outdoor use. Mattness, softness, hardness and anti-slip degrees vary according to the products. It can be used in wet places. It is easier to clean compared to other surfaces. It is recommended to use the products in wet areas, such as pool sides, bathroom floors, wet process businesses, by paying attention to the specified slip class. Products with high PEI abrasion class should be preferred in places exposed to heavy traffic and where there is a possibility of using abrasive shoes.

3 APPLICATION METHODS AND INFORMATION FOR USE

3.1 Safety First

While all the methods and procedures described here have been tested for safety, it is not possible to fully explain the importance of using the safest construction methods possible. What is described below; Here are some basic dos and don'ts. They do not replace the common sense of the person who will do the work. Always use caution, focus, and common sense when following the procedures described here:

- Always make sure that the electrical installation is safe; make sure that no circuits are overloaded and that all electrical appliances and electrical outlets are properly grounded. Do not use power tools in wet areas.
- Always read the labels on the packaging of adhesives, solvents and other products; Provide ventilation and follow all other warnings noted.
- When using tools and equipment, read and follow the instructions for use and especially the warnings.
- The ceramic cutting machine is used to cut ceramic tiles and similar materials suitable for the working size of the machine. This machine is specially designed for hobby and professional use. Cutting wood and metal materials is prohibited.
- Always make sure any settings are locked before continuing. For example, always check the bevel adjustment of the edge guard of a bench cutting machine or a portable cutting machine before starting work.
- Before using the ceramic cutter, place it on a flat and non-slip surface. The machine should not shake.
- Be sure to take precautions in accordance with the warnings specified in the user manuals.
- To avoid injury, always pay special attention to how each tool works.
- Always know the limits of your tools. Do not force them to do what they were not designed to do.
- When cutting pieces shorter than 7 cm on the work table or when cutting together, always hold them with the help of holders or pushers. Avoid working with short pieces if possible.
- Always wear safety glasses, especially when using power tools, tearing off existing materials, cutting concrete or frozen mortar, or cutting ceramic tiles with a knife or saw.

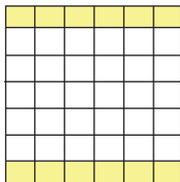
- Always be aware that you may not have enough time to reflexively recover from power tool injuries when in dangerous situations; everything happens so fast. Be awake!
- Always keep your hands away from knives, cutters, and other used workpieces.
- Always use an auxiliary handle drill to control torque when using oversized bits.
- Never work with power tools when you are tired or under the influence of alcohol or drugs.
- Never cut pieces that are much smaller than small pieces. Whenever possible, cut small pieces from larger pieces.
- Never change the blade or any part of your appliance while the power cord is plugged in, relying on the switch to be turned off.; You may have an accident. Make sure to unplug the power cord for these procedures.
- Never work in poor lighting.
- Never work while wearing loose-fitting clothing, hanging hair, open cuffs, or wearing jewellery.
- Never work with blunt instruments. Have them sharpen it or learn how to sharpen it yourself.
- Never use a power tool on a workpiece that is not strongly supported or clamped.
- Never support a workpiece with your leg or other body parts while cutting.
- Never carry sharp or pointed tools such as utility knives or chisels in your pockets. If you want to carry tools, use a leather pocket and a special-purpose tool belt.
- Always use suitable rubber or work gloves when handling chemicals, building materials.
- Always wear a disposable mask when working with odors, dust or fog. Use a special respirator when working with toxic substances.

3.2 Application Stages

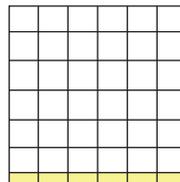
Before laying the ceramic tiles, some preparations and checks must be made. When there are deficiencies or omissions in the requirements described here, it can sometimes lead to irreversible or very costly consequences.

3.2.1 Preparation

1. Before starting the application, it is necessary that the environment is bright and the floor is clean in order to prevent possible mistakes from the beginning.
2. The place where ceramic tiles will be applied should be measured beforehand, the order and how the tiles will be placed should be planned from the beginning, and the adequacy of the existing ceramic tile should be checked according to this account.
3. The inner corners of the spaces may not always be exactly square. For this reason, pre-planning in floor coverings, determining the starting and ending points, determining the size and position of the piece ceramic tiles are necessary to get good results.



Proper cutting



Improper cutting
The process left on one side



4. The floor or wall where the ceramic will be laid should be smooth, if there are curvatures, level differences, should be corrected with suitable screed material beforehand, if there are drains on the floor, the desired slope towards the drain should be calculated and this angle should be applied with the disposal screed.

5. Before starting the process, it is necessary to have all the materials and hand tools to be used in the tile laying at hand.



Water gauge for smoothness of level



Laser level meter

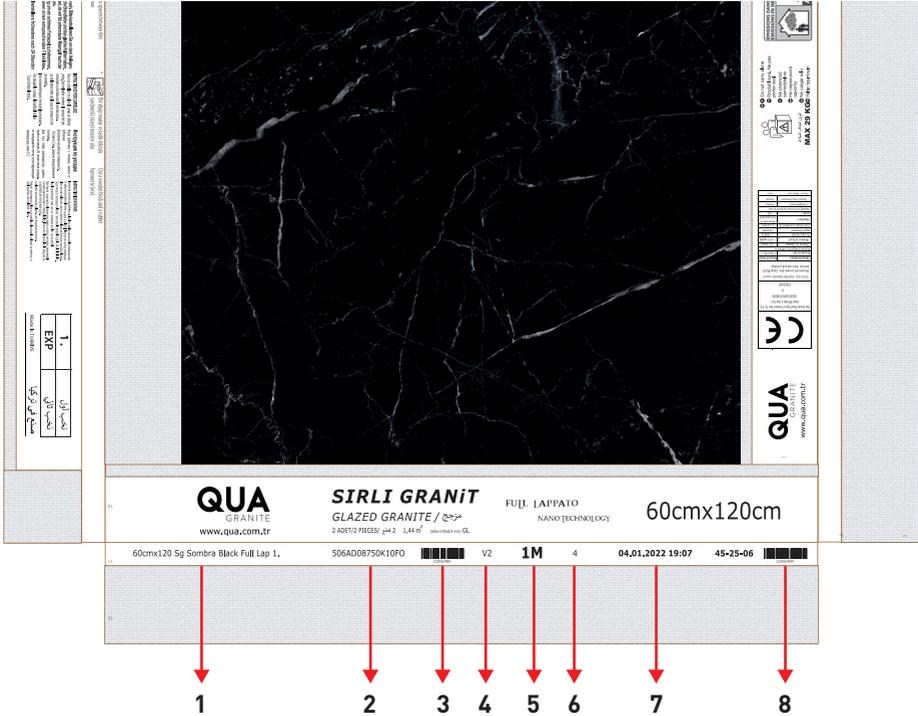


Professional
Cutter



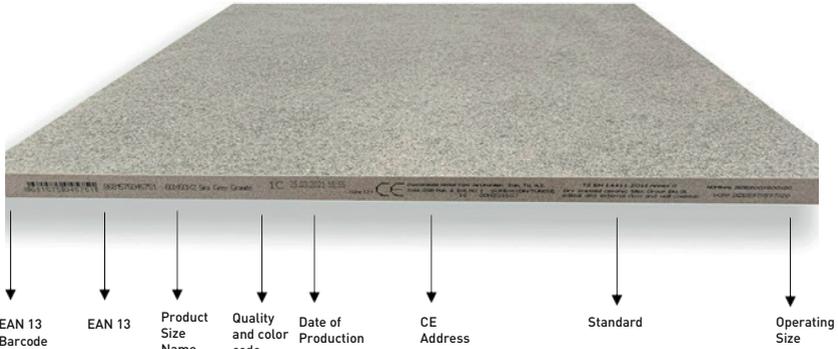
Safe
Working
Equipment

6. Ceramics to be applied should not be wet and should be used after they dry because they will not adhere if they are wet.
7. If there is dust behind tiles that prevent adhesion, tiles must be used after removing dust with a brush.
8. On-box information about ceramics to be applied must be controlled, products with the same production date and production code must be applied on the same areas. Unlike other producers, all of our QUA GRANITE products are rectified and produced in single size as micro-beveled, so boxes do not contain calibration code.
9. All of our 6.5 mm to 9 mm products are packaged in boxes. The details given below from the parts printed on the side of the box should be checked before the application;

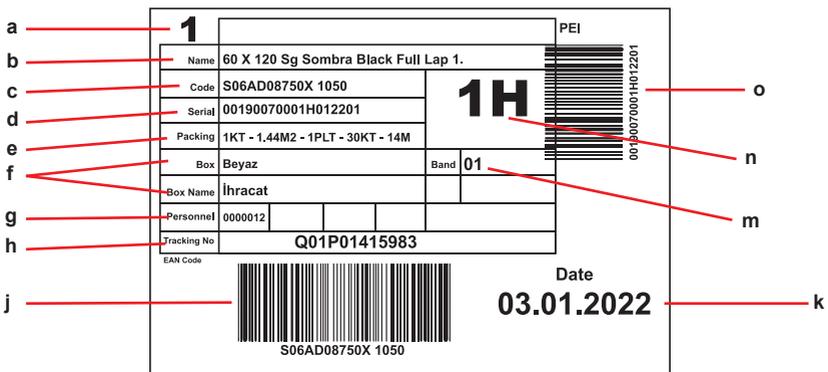


1. Contains descriptions such as product name, special customer name.
2. Contains material code of the product.
3. Contains EAN 13 code of the product.
4. Contains "V" code of the product.
5. Contains information on tonality of the product.
6. Contains packing strap number of the product.
7. Contains information on date and time.
8. Indicates shift and responsible operator information

20 mm and 30 mm thick tiles are produced with and without carton boxed but side printed, Cartoon Boxed products have the same information as those other thicknesses. On sides of the unboxed products, following printings are applied to define the tiles:



Details are printed on the edge of the tile as above. There is also information on the label over the plastic corner protector.



The sections on the label of pallet;

- a. Shows product quality (blank if the product is exported).
- b. Shows product name.
- c. Shows material code.
- d. Shows lot number- the first 8 digits show packaging information (00190307), next 5 digits show tonality information (0001H) and the last 4 digits show year and month of production (22.01)-.
- e. Shows packaging information such as number of tiles in the box, number of boxes in the pallet and pallet sqm.
- g. Shows details of box for the production (For example, While-in Export box).
- h. Shows information about personnel preparing the pallet label. H.Shows pallet tracking number.
- j. Shows information about barcode containing all information on the pallet label.
- k. Shows date of production.
- m. Shows the conveyor from which package comes out.
- n. Shows information about tonality.
- o. Shows Ean 13 information.

10. A few boxes of certain tiles must be opened to control if there is any broken or cracked tile, check possible color difference or surface fault by laying them down on the ground. If any of such fault is detected, those tiles must be separated and relevant officer must be informed. If fault detected is in an amount to affect laying process, you must not start working until you are responded.

11. There is information on the boxes in the form of print that directly concerns sellers, users, implementers and enforcers. It is extremely important that the person or persons concerned read and consider this information.



Apply the mortar that you mix thoroughly on the ground.



Harrow the surface.



Place the first tile to be guide.

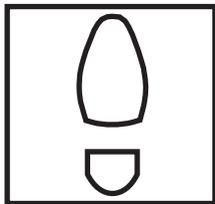


Proceed regularly by placing joint surplus between the tiles.

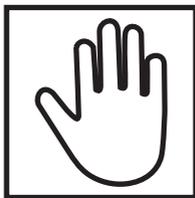


Level the surface with the help of a wooden jig and rubber mallet.

12. The signs and explanations on the box should be examined, it should be ensured that ceramics suitable for the application area and purpose are used.



Suitable for laying
on ground



Suitable for laying
on wall



Resistant
to freezing

All of Full lap, Matte and lappato products are indicated on the box with the phrase "Glazed Technical Granite" as follows.

SIRLI TEKNİK GRANİT

GLAZED TECHNICAL GRANITE / الجراذات التق المزجج

2 ADET/2 PIECES/ قطع 2 1,44 m² (600x1195x8,8 mm) GL

3.2.2 Application and Adhesion on the Ground

1. Construction chemicals and joint fillers should be selected according to the application site and bonding surface (plastered surface, gypsum-based surface, wood, concrete, etc.).
 2. It is recommended to use ready-made adhesives due to their high water and frost resistance, excellent bonding of porcelain tiles with low water absorption and ease of application.
 3. In the application, it should be ensured that adhesives and grouting materials suitable for different areas such as pool, exterior, interior wall and the type of product are used.
 4. When applying on large sized ceramics, care should be taken to ensure that there is no gap between the tile and the floor. The double-sided bonding method should be used.
- Attention should be paid to the color tone definitions on the product, products with different designs should be laid on the ground and checked, the products should be distributed and laid in accordance with the color tone. The use of products in different color tones in the same area and mixed together is considered as an application error.

5. If it is stated on the boxes of the tiles while applying; Considering the markings such as the laying direction, the application should be made with each piece facing the same direction.

6. While preparing the adhesive mortar and joint, the usage and preparation recommendations on the packaging should be followed. Their preparation with the recommended water rates directly affects the adhesion. While preparing the joints, mixing should be done with a low-speed drill and the application should be defined before the specified freezing times are exceeded.



7. Considering the settlement and expansion of the floor over time, a gap of at least 1 cm should be left from the wall edges and then the bonding process should be done.

8. When applying the adhesive, a ceramic comb of appropriate thickness should be used. For example, for large sizes such as 60x120 cm, a toothed comb with a greater depth (10 mm) should be used.



9. In all applications, the adhesive must be bonded after the adhesive has been applied to both the surface and the back of the tile. Adhesives should contact the back of the tile 100%. In order for the adhesion to be strong and for the adhesive to fully spread and adhere to the back of the tile, the tile should be tamped lightly with a rubber mallet.

10. Joint gaps should be filled with joint material after 24 hours at the earliest, in order for the glued ceramic to sit in place. The instructions in the user manual must be followed

11. Joint filler should be preferred due to its ease of application, water-repellent feature and high abrasion resistance. Jointless application should never be done. At the same time, rectified tiles must be protected against impact in order not to throw off their edges.



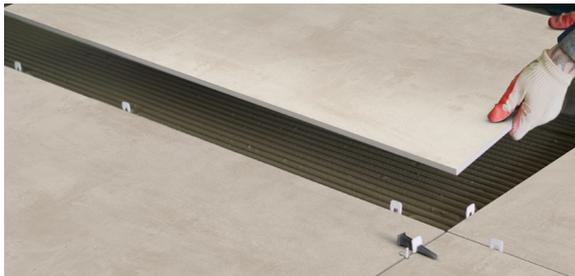
12. Epoxy based joint fillers should be chosen in places with heavy pedestrian traffic.

13. In large area applications, dilatation (expansion joint) space should be left. These areas should be reinforced with elastic filling material (polyurethane mastic) or expansion profiles.

14. Extending the time for joint grouting reduces the risk of yellowing and discoloration of the joints as the dimensions get larger and the air temperature is low. In addition, it will prevent the swelling of ceramics due to water vapor pressure.

15. QUA GRANITE tiles are produced as rectified and micro chamfered. Even in this way, a joint gap should be left to allow the movement of the tile for the building to settle. In the American standard ANSI A108.02 "General Requirements: Materials, Environmental and Workmanship-2010", it is necessary to leave a joint gap of 3 times the tolerance on the dimensions of the tiles (for example, $3 * 1.0 \text{ mm} = 3 \text{ mm}$ joint gap for a tile with 1.0 mm deviation) It is written that it should not be less than 1/16 inch (1.6 mm).

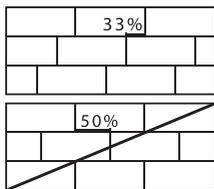
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16. Especially when laying rectangular and large size products such as 30x120 and 60x120 cm, the Ceramic Leveling System (wedge joint application) consisting of wedges, holders and forceps should be used to adhere them at regular joint intervals and at an even level. As in the example, using wedge wedges close to the corners and increasing the number in the middle as the tile size grows will make the application much smoother.



17. For products with an aspect ratio of more than 2 times such as 30x120 ($120/30 = 4$), as we have stated in the product boxes, the applications should be made in a 1/3 ratio. Information on the box is as follows. This means that for a product with a long side of 120 cm, it is tiled with a shift of $120 \text{ cm} * (1 / 3) = 40 \text{ cm}$.



ANSI A108.02 Section 4.3.8.2- For running bond/brick joint patterns utilizing tiles (square or rectangular) where the side being of set is greater than 18" (nominal dimension), the running bond of set will be a maximum of 33% unless otherwise specified by the tile manufacturer. If an of set greater than 33% is specified, specifier and owner must approve mock-up and lippage.

18. When necessary, the products can also be used by cutting them according to the dimensions. Since the surfaces of semi lappato or granular surface products are hard and scratch resistant, wet cutting or reverse cutting is recommended when cutting is required.



19. After the joint material is applied and the process is finished, the material adhering to the tile must be cleaned immediately. When it is dried without cleaning, cleaning becomes difficult, especially in relief and semi-lappato products.

20. Cement-based joints should be cleaned within 15-20 minutes after the application, and sensitive and fine cleaning should be completed within 24 hours.

21. Clean water should be used for fine cleaning and the cleaning water should be changed frequently.

3.2.3 Instructions and Recommendations for Mounting of 20mm and 30mm Tiles on Elevated Ground

1. In applications in the form of raised floors above ground level, the material is exposed to air flow and the effect of wind. The installer should seek the assistance of a qualified professional to check the suitability of the mounting system, ensuring that it complies with local laws, regulations and conditions of use. Failure to do so may result in serious injury or property damage.

2. The ceramic tile mounted on the raised pedestal system may break upon impact when a heavy object falls on it, and anyone standing or walking on this floor is at risk of injury. Failure to follow the manufacturer's instructions for installing tiles in raised plinth systems could result in serious injury.



Application on grass



Use on heavy load by adhering

3.2.4 Instructions for Project Engineers and Customers regarding Application of 20mm and 30mm Porcelains on Elevated Ground

When the use of ceramic product in buildings is planned, the project engineer and/or customer should carefully consider the project requirements regarding the technical characteristics of the tiles. To avoid the risk of damage or injury, we recommend as a manufacturer:

1.Regarding the raised floor installation, if a heavy object falls from any significant height, the ceramic tile may break on impact. Therefore, we suggest to check the specific use purpose before starting its installation and follow the table given below for upgraded installation. In some cases specified in the table, reinforcement (braided double fiberglass or galvanized steel sheet) must be applied to the back of the tiles supplied and applied by the manufacturer;

2.With reference to any dry-installation system above ground level, the manufacturer may consider wind load, load bearing, seismic events, etc. recommends to comply with local regulations and conditions of use regarding. Failure to follow these recommendations constitutes product misuse and may result in serious damage or injury.



Application on elevated ground

3.2.5 Pedestal Calculation and Usage Advice in Raised Floor Applications

Number of support feet to be used per unit m² in raised floor applications of 2cm and over porcelain ceramic tiles

In the raised floor applications of porcelain ceramic tiles over 2 cm thickness, the number of support legs that should be used per unit m² is calculated as follows;

Number of pedestals per m², including tile edge measurements from **L1** and **L2** meters

For tiles with 60 cm (0.60 mt) or less on both sides

= 1 :L1 :L2

For tiles with one side over 60 cm (0.60 mt)

= 2 :L1 :L2

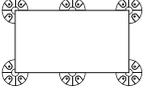
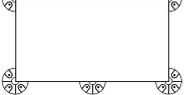
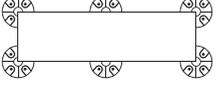
For tiles with one side over 60 cm (0.60 mt)

= 4 :L1 :L2

Number of pedestals per m² table for the most used sizes

cm	40	50	60	80	90	120
20	12,50	10,00	8,33	12,50	11,11	8,33
30	8,33	6,67	5,56	8,33	7,41	5,56
40	6,25	5,00	4,17	6,25	5,56	4,17
45	5,56	4,44	3,70	5,56	4,94	3,70
50	5,00	4,00	3,33	5,00	4,44	3,33
60	4,17	3,33	2,78	4,17	3,70	2,78
80	6,25	5,00	4,17	6,25	5,56	4,17
90	5,56	4,44	3,70	5,56	4,94	3,70
120	4,17	3,33	2,78	4,17	3,70	2,78

Use of Support Legs in Application on Elevated Ground and Recommendations for Users

PRODUCT SIZE	APPLICATION ON 2CM HEIGHT	APPLICATION ON 2CM - 10CM HEIGHT	APPLICATION ON 10CM - 30CM HEIGHT
60X60 (24"X24") 	WITH 4 SUPPORT (2,78 units/m ²)	WITH 4 SUPPORT (2,78 units/m ²)	* WITH 4 SUPPORT (2,78 units/m ²) * knitted with double glass fiber or with galvanized steel plate
45X90 (18"X36") 	WITH 6 SUPPORT (4,94 units/m ²)	* WITH 6 SUPPORT (4,94 units/m ²) * knitted with double glass fiber or with galvanized steel plate	* WITH 6 SUPPORT (4,94 units/m ²) * knitted with double glass fiber or with galvanized steel plate
60X120 (24"X48") 	WITH 6 SUPPORT (2,78 units/m ²)	* WITH 6 SUPPORT (2,78 units/m ²) * knitted with double glass fiber or with galvanized steel plate	* WITH 6 SUPPORT (2,78 units/m ²) * knitted with double glass fiber or with galvanized steel plate
60X90 (24"X36") 	WITH 6 SUPPORT (3,70 units/m ²)	* WITH 6 SUPPORT (3,70 units/m ²) * knitted with double glass fiber or with galvanized steel plate	* WITH 6 SUPPORT (3,70 units/m ²) * knitted with double glass fiber or with galvanized steel plate
30X120 (12"X48") 	WITH 6 SUPPORT (5,55 units/m ²)	* WITH 6 SUPPORT (5,55 units/m ²) * knitted with double glass fiber or with galvanized steel plate	* WITH 6 SUPPORT (5,55 units/m ²) * knitted with double glass fiber or with galvanized steel plate
NOTE: All different sizes of ceramic tiles in 20mm thickness may be used for applications on elevated ground with dead shores up to 2mm height. Please consult technical department of QUA GRANITE factory for other applications on elevated ground.			

4 CLEANING AND MAINTENANCE DURING AND AFTER APPLICATION

QUA Granite porcelain tiles are covering materials that add flexible style and permanent quality to your houses or commercial areas. With minimal maintenance, they will be in use for decades.

4.1 Cleaning and Maintenance for Porcelain Surfaces After Application

Use solvent depending on the product to clean residuals on porcelain tiles such as strong paint, mortar, epoxy grouting adhesive, etc. Always test the solvent in a small area. Apply plenty of undiluted solvent on a manageable area. Let the solvent remain on the stain before it dries until residuals of grouting material on the surface softens. If necessary, apply again by wiping with a cotton towel or sponge until the residual material is removed instead of waiting for it to soften. If necessary, rub with a nylon rubbing pad. Rinse thoroughly with fresh water. It is not recommended to use such solvents since they may harm products like natural stones and marbles or grouting paste.

If the joint filler residues harden on the tile surface after the application, the dirt that will adhere to these areas will make it difficult to clean the tile surfaces. In this case, the surfaces should be cleaned with joint solvent special chemicals.

4.2 Maintenance of Products with Matte - Antislip and Rough Surfaces

Qua Antislip tiles are hardened tiles which are more resistant to slipping than standard tiles thanks to a special technology. QUA Antislip products do not require a special maintenance. They may be cleaned and maintained as any porcelain surface. During application, residuals of grouting material and mortar on tile must be cleaned before they dry; otherwise, cleaning of the surface will be difficult due to rough surface. Time of cleaning especially after grouting work is much more important in products with rough surface.

5

CLEANING AND MAINTENANCE IN ROUTINE USE - PREVENTION OF DIRTS AND SCRATCHES

5.1 General Maintenance of Porcelain Tile Products with Matte and Polished Surface

Regular cleaning with warm water and soft soap is sufficient to ensure grounds look good. You may also use cleaning agents used for multiple daily purposes to prevent stains of hard water accumulation, muscosity or soap stains. Always dry your porcelain tiles thoroughly after cleaning.

Porcelain tiles include those with polished and matte surfaces with smooth texture and molded granular or semi lapp surfaces with rough texture.

Cleaning and maintenance is very easy for products with smooth texture. It is not recommended to use highly concentrated acid and bases although tiles are not damaged from any acid and base substance except hydrofluoric acid. In addition, use of hard cleaning tools such as brush, sandpaper, etc. is not also recommended.

For products with rough surface, it is always recommended to wipe the surface quickly by using proper cleaning agent after rough-hewing with warm water without letting stain dry. Use nonabrasive cleaning products and tools. Sweep or vacuum surfaces before wiping wet to clean dust or solid residuals. Even if porcelain tiles are resistant to scratches, abrasions and stains, they may not be resistant to some damages. Do not use abrasive cleaning equipment on products with polished surfaces such as metal brush. If you continue constructional works on the area on which polished products are applied, product surfaces should be covered with a hard cardboard after cleaning rough dust that may scratch the surface with vacuum or sweeper to prevent scratches. Avoid from exposing your porcelain tiles to permanent inks or paints that are hardly removable or unremovable. If porcelain surfaces are exposed to permanent pen or paint, wash the area with water as soon as possible. After you wash the surface; apply the approved cleaning agent, rinse and dry thoroughly. Even if porcelain tiles are resistant to stains of fruit juice, wine, coffee and other food products, it is best to wipe residuals to prevent potential stains. Select proper product from the table below for unremovable stains and clean the surface with strong solvent by purifying it with water without keeping the agent on the surface for long.

Be careful not to drop hard and heavy objects on the ceramic tiles. Our products pass EN 10545-5 ball impact test. Nevertheless, tiles may break off the surface if heavy and sharp-edged equipment fall onto the tile.

5.2 Maintenance of Metallic Glazed Tile

Use nonabrasive and liquid domestic cleaning agents to clean metallic glazed tiles. Avoid from using ammonia, bleach, acidic abrasive agents or other cleaners containing hazardous / contaminating compounds. If you will use a new cleaning agent, test the agent on a small area first to see compatibility with your metallic glazed tile; then you may apply on the whole surface.

Product with metallic surface must be rinsed with plenty of water after cleaning and residuals of cleaning agent on the surface must be cleaned thoroughly.

Do not use abrasive products, rubbing sponges, steel wool, sand paper and other abrasive tools while cleaning metallic glazed tiles. This type of tile has a polished surface and this makes it prone to being scratched. Glass and metal tiles must always be swept before mopping. The reason is mopping with stains on the tile will cause scratches since sand moves on the surface.

5.3 Maintenance of Grouting Material

Grouting has two purposes: Filling gaps between tiles and giving a space to the tile to expand. This application reduces break and becomes a permanent and inseparable part of finished mounting. Porcelain tiles are nonpermeable, but also select nonpermeable grouting materials for easy maintenance. It is recommended to use a safe product to prevent stains or for easy cleaning. Cleaning grouting materials is one of the most difficult processes of porcelain tile care. These materials prone to catch dirt and fade out over time. They require more special cleaning and maintenance than tile. Joints must be cleaned periodically to prevent accumulation of dust. Use of cleaning agents containing acid and ammonia (and other hard chemicals) may harm especially grouting material of tile. Select products compatible with the grouting material to prevent joints from fading of being damaged. Routine joint cleaning may be made with concentrated domestic or commercial cleaning agent used for daily purposes. Prefer cleaning materials with contents that do not harm joints. Rinse and dry joints with fresh water after you finish cleaning. In environments that are exposed to heavy traffic and moisture, check if there is any impairment or destruction on grouting material and repeat grouting application if deemed necessary. Special cleaners must be used as specified by producer of the chemical. Following table lists cleaning agents which may be used for various types of stains.

5.4 Spotter and Recommended Cleaning Agents

Stain Type	Recommended Cleaning Agent
Alcoholic and nonalcoholic drinks	Hot water, Detergent for daily use, Bleacher
Vegetable oil	Liquid detergents
Synthetic oil Grease	Liquid detergents
Cellulosic oil paint	Carbonated water
Synthetic oil paint	Alcohol Cellulosic thinner
Plastic paint	Synthetic thinner
Rubber	Water Acetone
Rust-oxidization stain, lime scale	Rust and Lime remover
Iodine stain	Ammonia
Candle Cement	Thinner, turpentine
mortar	Sulphuric acid
Ink stain and marker	Hot water, alcohol

6 TECHNICAL INSPECTION, METHODS FOR COMPLAINTS

Products must always be checked before application and determined at the first stage depending on area of application to use the products with the same code and production date at the same time. In order to assess each possible complaint about ceramics to be applied properly, information on box of each product including code and date must be kept after process is completed. Boxes contain printed information concerning sellers, users, applicators and application officers. It is very important person or persons concerned read and consider this information. These matters are mentioned above. A few boxes of certain tiles must be opened to control if there is any broken or cracked tile, check possible color difference or surface fault by laying them down on the ground. If any of such fault is detected, those tiles must be separated and relevant officer must be informed. If fault detected is in an amount to affect laying process, you must not start working until you are responded. If any problem arises during application, you must contact the dealer from which the product is bought. Stop working, apply to information of authorized person and take action according to his/her suggestion. Replacement of defective products during laying process will cause much more loss of time-workforce and cost. According to standards, complaints about products with obvious defects are not accepted after they are applied. We may get unintended appearance due to incorrect applications. Any detection made during application causes unintended scenes and loss of workforce. Therefore, you are recommended to work with masters who comply with laying instructions given by licensed and professional layers and who are familiar with the products. If insoluble problems are detected during product controls, stop the work immediately and contact dealer of seller from which the product is bought, share clear explanation, photographs of the problem and product box information, then receive technical services from the factory. When the problem is shared with our technical service department;

- Information sent is controlled quickly,
- Records on the date of production are reviewed,
- Product is examined remotely if possible
- or at the address of the customer if deemed necessary,
- Then the solution is provided quickly.

Complaints of customers are tracked by the top management with our assessment system through software named Canias and Atlassian Jira and are solved quickly to meet needs of our customers. Therefore, we establish a close relationship with our customers and direct them to use the products correctly. In addition, substantial problems are solved at source. If problems arise from products, our technical team collaborating with production is informed and permanent solutions are provided at the stages of production.

7 CRADLE TO GRAVE LIFE CYCLE IN QUA GRANITE PORCELAIN TILES

Tile production basically consists of raw material supply, sludge preparation, spray drying, pressing, pre-drying, glazing, firing, quality separation and packaging, and shipping processes.

The production process starts with raw material preparation followed by spray drying and granulation processes. As a result of spray drying, sludge (biscuit) is obtained. Excess moisture in the sludge is removed by drying. Then, the raw tiles are fired, if necessary by going through the glazing process. After the firing stage, it comes to the polishing-sizing part. After the quality control processes, the final products are packaged and sent to distribution.

The system limits used in the Tile LCA study, including the final product packaging, distribution processes, and demolition and disposal after the product life cycle is completed, are shown in the table below. The purpose here is; the determination of the environmental effects of the product, starting from the raw material per unit m2, during the production process, conveying it to the customer, use, maintenance and after use, from the cradle to the grave, and making continuous improvements in these matters and monitoring them.

System Limits Definition (under X=LCA, MND=Module not declared)

RAW MATERIALS			MANUFACTURING PROCESSES		USE								END OF LIFE				BENEFITS AND LOADS REMAINED OUTSIDE THE SYSTEM
RAW MATERIAL SUPPLY	SHIPPING	PRODUCTION	SHIPPING TO USER	APPLICATION	USE	MAINTENANCE	REPAIR	CHANGE	RENEW	OPERATIONAL ENERGY USE	OPERATIONAL WATER USE	DESTRUCTION	SHIPPING	WASTE PROCESS	DISPOSAL	RE USE - RECYCLING - RE GAIN POTENTIAL	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	MND	X	X	X	X	X	X	X	X	X	X	MND	MND	MND	MND	MND	

A1= Includes raw material procurement, raw material extraction and pre-treatment before production. Production for tile production begins with raw materials.

A2= It is related to transportation to the production site, transportation of the raw material to the facility and its use within the factory.

A3= The production phase starts with the preparation of the sludge. It is then dried by spray drying, pressing, pre-drying, glazing, firing, polishing-rectifying, quality separation and packaging.

A4= Shipping to the user includes the shipping stage for the product to reach the final consumer.

A5= The application phase covers the processes during the application of the product.

B1= The use phase looks at the effects during the use of the product. Tiles do not cause any emissions during use.

B2= Maintenance phase includes cleaning with water and detergent to maintain the function throughout the life of the product.

B3= For the repair phase, it is assumed that no action is required during use.

B4= For the replacement phase, it is assumed that no action is required during use.

B5=For the regeneration phase, it is assumed that no action is required during use

B6= No operational energy consumption.

B7: No operational water consumption.

C1: The environmental impacts generated during the disassembling phase are very low and therefore negligible.

C2: The waste transportation stage covers the transportation of the product to the final disposal site after it has expired and turned into waste.

C3: Waste recycling concerns the crushing of discarded ceramic tiles before they are recycled or reused.

C4: The disposal stage is the last stage when the product completes its life. Tiles are usually sent to cement factories.

QUA GRANITE LCA SYSTEM LIMITS

It includes stages A1 and A3 in raw material procurement, A4 and A5 in production processes, and stages from B1 to B7 in use.

8

QUA GRANITE WARRANTY CERTIFICATE

QUA
GRANITE

25 January 2021

As QUA GRANITE,

we declare our porcelain tiles comply with requirements of the Annex G of International Standard ISO 13006 dated January 25th, 2021 and European Standard EN 14411 Our products have mechanical and hydrothermal technical properties in accordance with the standard specified.

Our porcelain tile products (nonslip, matte, matte, sateen matte, polished glazed, metallic glazed) that we produce according to different types of surfaces can be applied on grounds and walls in compliance with their technical cards provided to all these series specifically. In order to prevent dust, sand and other hazardous materials from leaving marks on the surface, it is required to use appropriate tools since various tile surfaces may be affected differently. Properties of each series of tile are provided in their technical cards. Our porcelain tiles can be applied on grounds or walls with glue, adhesive agent, sand or cement where necessary according to area of application.

MAINTENANCE OF METALLIC GLAZED TILES

Use nonabrasive and liquid domestic cleaning agents to clean metallic glazed tiles. Avoid from using ammonia, bleach, acidic abrasive agents or other cleaners containing hazardous / contaminating compounds. If you will use a new cleaning agent, test it in a small area first to see compatibility with your metallic glazed tile.

PRODUCT WITH METALLIC SURFACE MUST BE RINSED WITH PLENTY OF WATER AFTER CLEANING AND RESIDUALS OF CLEANING AGENT ON THE SURFACE MUST BE CLEANED.

AVOID FROM using abrasive products, rubbing sponges, steel wool, sand paper and other abrasive tools while cleaning metallic glazed tiles. This type of tile has a polished surface and this makes it prone to being scratched. Glass and metal tiles must always be swept before mopping. The reason is mopping with stains on the tile will cause scratches since sand moves on the surface.

Exceptions;

Following cases are not covered by warranty since faults do not arise from defects in tiles. These are general explanations and relevant standards are explained in this manner.

1. Use of tiles under pressure much higher than normal pressure or contrarily to normal use of the product.
2. Destruction resulted from foreign agents and / or materials.
3. Improper cleaning and maintenance.
4. Exploitative use in addition to mechanic or manual abrasion.
5. Damages arising from faults of transportation or visual production as determined before laying. Please pay attention that materials must be checked before laying, defective materials must not be mounted and must be separated for quality control examination.
6. Faults arising from laying processes conducted by persons other than licensed professional layers or without complying with laying instructions.

For further information, we are always at your disposal.

Best regards.

Canan Güven
Technology Director

QUA GRANITE HAYAL YAPI VE ÜRÜNLERİ SANAYİ TİCARET A.Ş.

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QUA
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