2 0 1 8

# INSTALLATION, USE, CLEANING AND MAINTENANCE MANUAL

Release 1.0

atlas concorde

# Installation, use, cleaning and maintenance manual

## PURPOSES OF THE MANUAL

1. A nice tile does not suffice to have a nice floor: a correct installation is very important.
2. Guaranteeing a result lasting over time
3. Eliminating any possible problems
4. Supplying guidelines to be used in all markets where there is no installation manual/norm.

Any suggestion about installation and maintenance do not substitute and/or replace any law or any regulation in force in the country the Atlas Concorde Product is installed. Such a suggestions about installing and maintenance are a result of a research and tests made and developed in our technical department and a result of a partnership with the companies with more experience in the field of instalment and maintenance.

This Manual is drafted in Italian; this language shall prevail in case of inconsistency of the translation in other languages.

# 1 INSTALLATION

## 1.1 PRELIMINARY CHECKS: REQUIREMENTS AND SPECS ON THE CONDITIONS OF THE SUBSTRATE

The substrate for the tiling must comply with these requirements as for the conditions:

- **curing;**
- **integrity;**
- **surface resistance (sturdiness);**
- **dimensional uniformity;**
- **surface finishing;**
- **humidity;**
- **absence of contaminating agents.**

These requirements are defined and specified below, and for each of them restoration techniques/interventions are indicated that the work manager shall mandate in case of non-conformity.

### 1.1.1 Curing

The substrate must be cured and therefore dimensionally solid.
Indicative practical references, to be used as a guide in standard conditions – in good weather conditions – are the following: a concrete structure is considered dimensionally solid 6 months after the installation, a screed or a plaster of cementitious mortar can be considered dimensionally solid after 28 days, that is after 7-10 days every cm of thickness.
The previous values are referred to traditional screeds and plasters prepared on site.
In case of ready products or other solutions, follow the indications and rules of the manufacturers.

### 1.1.2 Integrity

It is evaluated by visual observation.
The substrate must be intact, that is free of cracks at the installation and of any detachment of its components.
Any possible crack must be eliminated.
In case of screeds, check if cracks may be due to hydraulic shrinkage.
If this is the case, before the installation check that the shrinkage is terminated.
Then restore the integrity, and thus close the cracks with suitable materials, generally organic ones, for example based on epoxy resins (Figure 1).

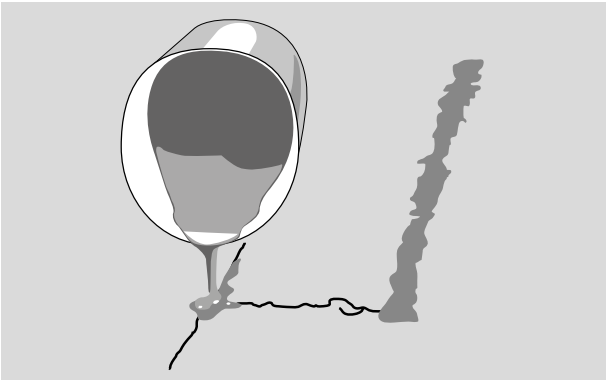


*Figure 1. Restoring of cracks*

In case of existing floor or wall tiling, the possible finishing layer (tiles, stone materials, parquet, etc.) must be bonded to the substrate (inspect by percussion).
As a general rule, elements which are not perfectly bonded must be removed.

## 1.1.3 Surface resistance (sturdiness)

It corresponds to the mechanical resistance of the substrate surface layer and gives an assessment of the risk that, in operating conditions, this layer may show failures causing detachment of tiling elements. This assessment is very important, above all in case of tiling exposed to high static and dynamic loads.
The surface resistance can be checked empirically by scratching vigorously the screed surface with a big steel nail, so as to make a set of squares approximately sized 2x2 cm.
The surface resistance is considered acceptable if no deep incision is made and no crumbling occurs.
If the surface resistance is not satisfactory the substrate must be consolidated, that is the loose surface layer must be removed, dust must be carefully eliminated and a suitable consolidating primer must be applied; this primer must be chosen and selected according to the instructions of the manufacturer in the relevant product technical sheets.
A good surface resistance is not sufficient for good mechanical characteristics: screeds very resistant on the surface may be poorly resistant in their thickness and not sufficiently compact.
In case of substrates for **external façade tiling**, poor surface resistance conditions may lead to the use of integrated mechanical fastening systems for the tiles in addition to the adhesive installation (Figure 2).

*Figure 2. Example of integrated mechanical fastening system*

## 1.1.4 Dimensional uniformity

It refers to the substrate surface layer (installation surface).
It can be measured and assessed using the same methods used for measuring the flatness of the finished tile.
In case of installation with **open joint**, lthe surface of the substrate must generally comply with the same requirements for the finished tiling.
In this case, the deviation in flatness must be less than 3.0 mm under a straight edge of 2.0 m.
In case of installation with adhesive with **min. joint** lthe evenness of the substrate, the flatness in particular, must be considered as a critical factor.
In this case, the deviation in flatness must be less than 1.5 mm under a straight edge of 2.0 m.
In the following Figure 3, admitted deviation for flatness are shown.

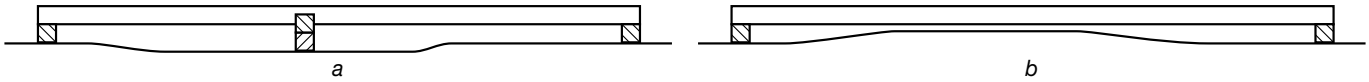
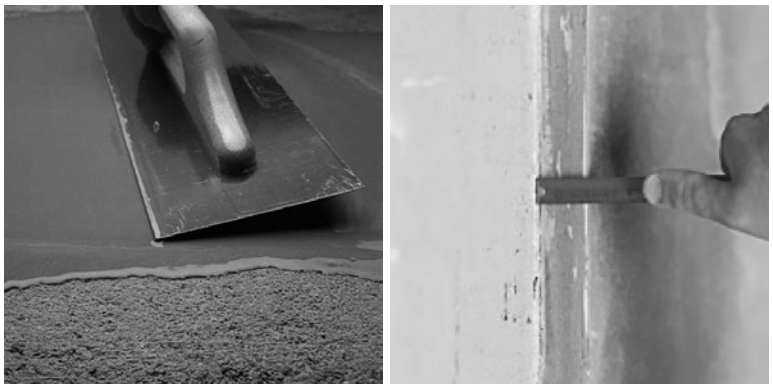



*Figure 3. Flatness measurement with the straight edge. Admitted deviations for both type of sub base curvature*

In case of surface not complying with the specified requirements, and therefore not regular, a **levelling layer** (floor) (Figure 4a) or an **adjusting layer** (wall) (Figure 4b) must be arranged, or another suitable measure.



*a* *b*

*Figure 4.a: levelling layer, b: adjusting layer*

## 1.1.5 Surface finishing

The finishing degree of the installation surface can affect the adhesion between adhesive and substrate.
Generally, a smooth installation surface is disadvantageous.

## 1.1.6 Humidity

The substrate must be dry on the surface, so as to avoid the risk of efflorescence.
The residual humidity in the body is determined using a carbide hygrometer for the measurement, according to UNI 10329.
Throughout the thickness of the substrate and for all the measurements made, at least one for each room, the max. allowed percentage is:

- 3% for screeds of class CT (based on cement and special binders, according to UNI EN 13813);
- 0.5% (0.3% in case of substrate with radiating A/C system) for screeds of class CA (based on calcium sulphate / anhydrite).

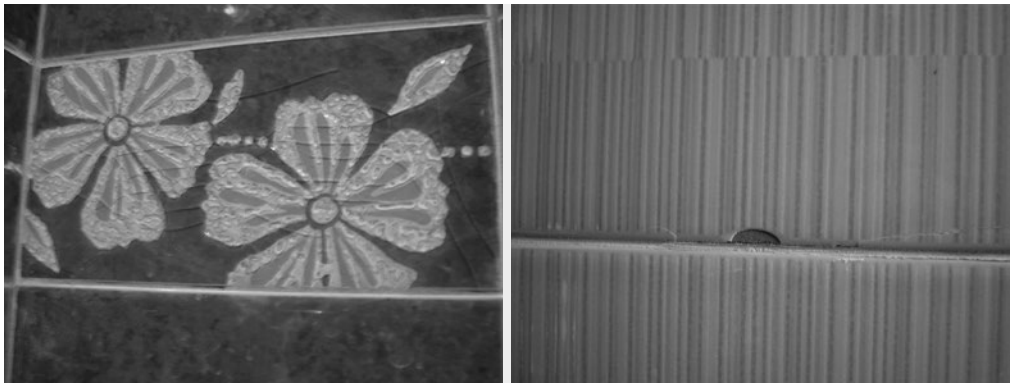
The above limit of 3% also applies to substrates based on cement for external tiling.
In such applications the substrates must be protected against rainfall in advance.
If the above limit is not complied with, a waiting time in suitable environmental conditions can be expected, or the use of specific materials and systems (possibly with relief of steam tensions), following the instructions and recommendations of the manufacturers carefully.

## 1.1.7 Presence of contaminating agents on the installation surface

The contaminating agents potentially present in the substrates for ceramic tiling are cement residues, stripping oils, traces or residues of paints, adhesives, etc.
The substrate surface - installation surface, on which the adhesive is applied – must be free of these contaminating agents, that are therefore eliminated with specific removal systems.

## 1.2 CHOICE OF THE ADHESIVE

Porcelain stoneware is a material with a vitrified surface, with very reduced porosity in the back side, thus making the adhesion of the tiles to the traditional mortar of sand and cement less immediate.
For this reason, the installation with specific adhesives ensuring a higher safety is recommended.
This recommendation also applies to wall tiles in white body, in order to prevent defects after the installation from arising (for example, later crazing or chips or flakes on the edges) that may possibly originate if traditional mortars too rich in cement are used.



a b

*Figure 5. a: later crazing, b: chippings or rough edges*

Therefore, it is recommended to follow the instructions in the technical sheet of the manufacturer before using the adhesive.

Generally, the choice of the adhesive strictly depends on the following factors:

- type of substrate;
- type and size of the tiles to be installed;
- final use (floor/wall, indoors/outdoors);
- operating temperatures and climate conditions at the installation: the installation cannot usually be made if the temperature of the air, of the substrates or of the materials is lower than 5°C or higher than 35°C and (above all outdoors) if the weather conditions are bad;
- time available for the ceramic tiling to be ready for use.

If the installation takes place:

- at low temperatures, or if the ceramic tiling must be ready for use rapidly, the use of rapid setting adhesives is more advisable (class F – EN 12004)
- at high temperatures or with wind exposure there are more chances of the “surface skin” to form more rapidly, and therefore adhesives with extended open time (class E – EN 12004) are more advisable.

See the table below for an easier selection of the adhesive, namely of the relevant class according to the type of installation substrate.

| FINAL USE | TILE TYPE | TILE SIZE | RECOMMENDED ADHESIVES | |
|---|---|---|---|---|
| Type of substrate | Type | [cm] | European norm EN 12004 | |
| | | | STANDARD SETTING | RAPID SETTING |
| INTERNAL FLOOR APPLICATIONS | | | | |
| Cementitious screeds[1]<br>Existing cement floors[2] (wrought, bush-hammered)<br>Anhydrite screeds[1] (after the application of a suitable primer. Type PRIMER G.)<br>Heating screeds[1.5]<br>Ceramic, terrazzo tile or natural stone floors[2]<br>Waterproofing in bathrooms | porcelain stoneware | < 30x30 | Improved cementitious adhesives with extended open time (class C2E). Type: KERABOND PLUS *, ADESILEX P9. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 30x30; < 60x60 | Improved slip resistant cementitious adhesives with extended open time (class C2TE). Type: KERAFLEX. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 60x60[4] | Improved deformable cementitious adhesives with extended open time (class C2E - S1). Type: KERAFLEX.EASY S1, ULTRALITE S1, KERAFLEX MAXI S1, KERAFLEX MAXI S1 ZERO. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| INTERNAL WALL APPLICATIONS | | | | |
| Cementitious plaster or mortar<br>Gypsum (plasters or panels after the application of a suitable primer. Type PRIMER G)<br>Cast concrete<br>Gypsum boards (after the application of primer on gypsum-based joints. Type PRIMER G)<br>Waterproofing in bathrooms and showers<br>Existing ceramic tiles[2] | white body wall tiles | Any[4] | Improved slip resistant cementitious adhesives with extended open time (class C2TE). Type: ADESILEX P9 | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | porcelain stoneware | < 30x30 | Improved slip resistant cementitious adhesives with extended open time (class C2TE). Type: ADESILEX P9 | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 30x30; < 60x60 | Improved slip resistant cementitious adhesives with extended open time (class C2TE). Type: KERAFLEX. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 60x60[4] | Improved slip resistant and deformable cementitious adhesives with extended open time (class C2TE - S1). Type: ULTRALITE S1, KERAFLEX MAXI S1, KERAFLEX MAXI S1 ZERO. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| EXTERNAL FLOOR APPLICATIONS | | | | |
| Cementitious screeds[1.6]<br>Concrete slab[1.6]<br>Waterproofing coats[3.6] | porcelain stoneware | < 30x30 | Improved slip resistant cementitious adhesives with extended open time (class C2TE). Type: KERAFLEX. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 30x30; < 60x60 | Improved slip resistant and deformable cementitious adhesives with extended open time (class C2TE - S1). Type: ULTRALITE S1, KERAFLEX MAXI S1, KERAFLEX MAXI S1 ZERO. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 60x60 | Improved, highly deformable cementitious adhesives with extended open time (class C2E - S2). Type: ULTRALITE S2, KERABOND PLUS+ISOLASTIC. | Improved, highly deformable cementitious adhesives with extended open time (class C2FE - S2). Type: ELASTORAPID, ULTRALITE S2 QUICK. |
| EXTERNAL WALL APPLICATIONS | | | | |
| Cementitious plaster<br>Concrete cast on site or prefabricated[7] | porcelain stoneware | < 30x30 | Improved slip resistant and deformable cementitious adhesives with extended open time (class C2TE - S1). Type: KERAFLEX MAXI S1, KERAFLEX MAXI S1 ZERO. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 30x30; < 45x45 | Improved slip resistant and deformable cementitious adhesives with extended open time (class C2TE - S1). Type: ULTRALITE S1, KERAFLEX MAXI S1, KERAFLEX MAXI S1 ZERO. | Improved slip resistant and deformable cementitious adhesives (class C2FT - S1). Type: KERAQUICK S1, ULTRALITE S1 QUICK. |
| | | ≥ 45x45[4] | Improved, highly deformable cementitious adhesives with extended open time (class C2E - S2). Type: ULTRALITE S2, KERABOND PLUS+ISOLASTIC. | Improved, highly deformable cementitious adhesives (class C2F - S2). Type: KERAQUICK S1 +LATEX PLUS, ULTRALITE S2 QUICK, ELASTORAPID. |

*Table 1. Classification of the adhesives according to the final use*

For every case not indicated in the table, namely for every specific information on the preparation of the substrate and/or its installation, contact MAPEI S.p.A. technical department, mail: assistenzatecnica@mapei.it, mob. +39 335 1635588.

NOTE:
(1) In residential premises the screed must have a mechanical resistance to compression higher than 20 N/mm$^2$; in commercial premises, this value must be at least 30 N/mm$^2$.
The following conversion table shows the importance of a perfect installation of the tiles on site.

| Tabella di conversione per diversi materiali | | | | |
|---|---|---|---|---|
| **Tipi di materiale** | | **N/mm$^2$** | **N/cm$^2$** | **KN/cm$^2$** |
| Malta di cemento gr. III | | 10 | 1.000 | 1 |
| Malta di cemento di qualità | | 20 | 2.000 | 2 |
| Posa a colla | | 15 - 30 | 1.500 - 3.000 | 1,5 - 3 |
| Malta con resine epossidiche | | 60 - 75 | 6.000 - 7.500 | 6 - 7,5 |
| Massetto di cemento | CT, C12 (ZE 12)<br>CT, C20 (ZE 20)<br>CT, C30 (ZE 30) | 12<br>20<br>30 | 1.200<br>2.000<br>3.000 | 1,2<br>2<br>3 |
| Massetto con inerti duri | | 65 | 6.500 | 6,5 |
| Cemento armato | C20/25 (B 25)<br>C30/37 (B 35) | 25<br>35 | 2.500<br>3.500 | 2,5<br>3,5 |

*Table 2. Nominal compression resistance for typical material used in screed destination*

The relatively low values of the cement mortar and of the adhesive installation can be balanced only by a special type of installation, made perfectly (composition of the mortar, water/cement value and manual or mechanical grouting).
The compression resistance of the tiles is not ruled by norms, but **it increases from 10 to 20 times if the tile is applied with adhesive installation according to the double-spreading method**, as practice tests have demonstrated.

(2) It is more and more frequently necessary to make new tiling overlapped to existing ones..
This is the case, for example, of restoration of old houses where works must be carried out very rapidly.
The installation of tiles on existing floors can be made only if the floor is subject exclusively to light foot traffic and if the existing floor is:
i) PERFECTLY ADHERING TO THE SUBSTRATE;
ii) FREE OF CRACKS.
If these conditions exist, before the installation it is essential
to clean the floor thoroughly, with a 10% solution of water and sodium hydroxide, then rinse to eliminate all dirt completely.
If these conditions do not exist it is essential:

- Remove the tiles that are detached and/or cracked and any possible crack in the screed below; cracks must be widened and then sealed by pouring synthetic resin, type EPORIP-MAPEI;
- Carefully clean the floor as indicated above;
- Fill the gaps created by the removal of the tiles and possible joints with nearby floors with different level (for example, in case of demolition of internal partitions) with cementitious levelling products with quick setting, , such as ADESILEX P4 – MAPEI or with thixotropic cementitious levelling products, such as NIVORAPID – MAPEI.

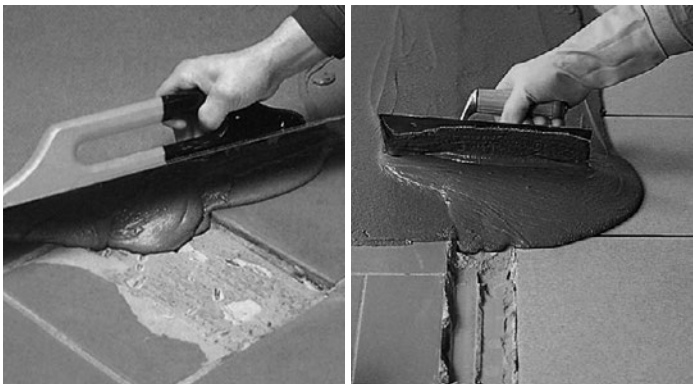


*Figure 6. Cementitious levellings*

The floor must also be perfectly bonded on the substrate.
To improve the adhesion of the new tiling, it is essential to clean with a diluted solution of water and sodium hydroxide or alkaline detergent, then to rinse.

(3) For installation recommendations for raised floors outdoors, as well as for the various dry installation techniques of **LASTRA 20mm** (installation on grass, sand, gravel or for raised installation) refer to § 1.4.4 Dry installation of LASTRA 20mm.

(4) For the installation of **XL sizes** (cm: 120x120 and cm: 120x240) and relevant technical precautions, refer to the specific **technical manual** by Atlas Concorde.

(5) The screed must generally be higher than the coil height by 2.5 cm; the installation must absolutely be made after a switching-on cycle of the system.
This is important for drying the residual humidity and determining the sealing of the substrate and the possible occurrence of cracks.

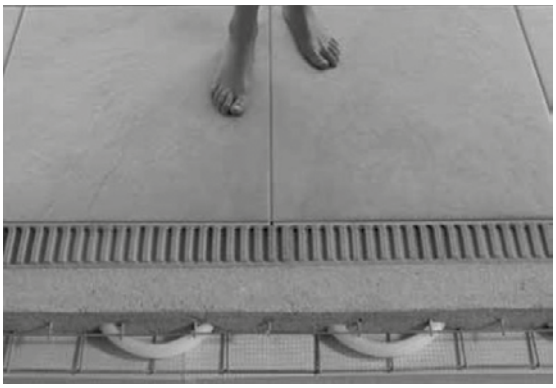


*Figure 7. Stratigraphy of an heating screed*

(6) In external floors, to make the drain of rain and wash water easier, it is very important to use a substrate that enables the final tiling to have a steady and even sloping between 1.25% and 2.5%.

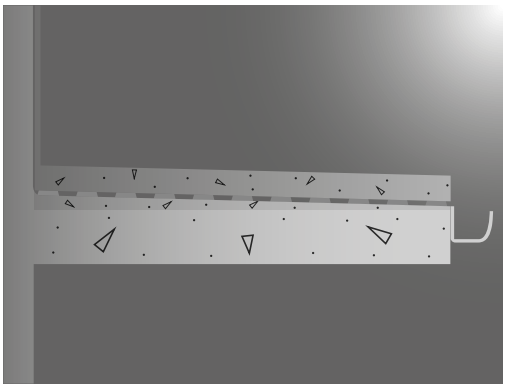


*Figure 8. Steady sloping substrate for external floorings*

(7) With special reference to substrates in reinforced concrete, it is absolutely necessary to level any height difference applying a levelling mortar.
These height differences must not be higher than 3 mm every height meter.

(*) Product not recommended for overlapped installation

(**) Product not recommended on waterproofed surfaces and existing tiles, concrete and plasterboard

In table 1 Atlas Concorde indicates the trade names of the adhesives produced by the partner Mapei S.p.A.
This does not preclude the use of any other adhesive of a different manufacturer in the installation, provided that it has equivalent technical performance (same classification according to the norm EN 12004).

## 1.3 ADHESIVE APPLICATION

The adhesive must be applied on the substrate using a squeegee with tooth suitable for the tile size and to the wetting required on the slab back side.

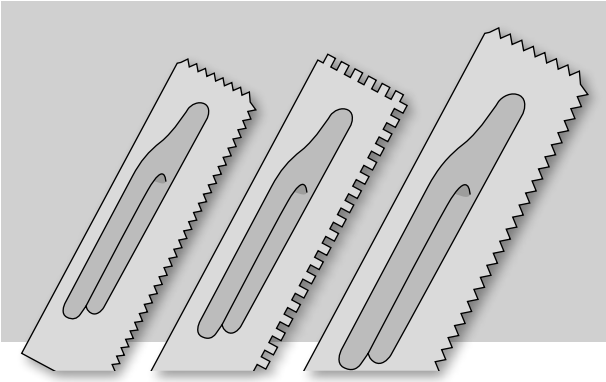


*Figure 9. Squeegee with variable tooth*

The specific recommendations according to the final use follow here.

### 1.3.1 Internal and/or external floor applications

Nel caso di **pavimenti residenziali** in ambiente interno:

L
LIGHT

LIGHT TRAFFIC
CALPESTIO LEGGERO
RESIDENTIAL AREAS (bedroom, livingroom, study, kitchen, bathroom)
RESIDENZIALI (camere da letto, soggiorni, studi, cucine private, bagni privati)

made with tiles sized **30x30** or **smaller**, the back side of the tile must be in direct contact with the adhesive for at least 70% of the surface.

If the installation takes place:

- on heating screeds;
- in commercial and/or industrial internal premises;

E
EXTREME

EXTREME HEAVY TRAFFIC
CALPESTIO MOLTO PESANTE
HEAVY COMMERCIAL HIGH TRAFFIC AREAS (underground and railways stations, etc.)
COMMERCIALI PESANTI A TRAFFICO ELEVATO (metropolitane, stazioni ferroviarie, etc.)

H
HEAVY

HEAVY TRAFFIC
CALPESTIO PESANTE
HEAVY COMMERCIAL AREAS (malls, airports, places of worship, schools, museums, squares, hospitals, etc.)
COMMERCIALI PESANTI (mall, aeroporti, luoghi di culto, scuole, musei, piazze, ospedali, etc.)

M
HEAVY

## MEDIUM TRAFFIC
## CALPESTIO MEDIO

MODERATE COMMERCIAL AREAS (restaurants, offices, showrooms, public offices, hotels, business, lounges, etc. save for obligated pathways)
COMMERCIALI MEDI (ristoranti, uffici, negozi, bagni pubblici, uffici pubblici, hotel, business luonge, etc. ad esclusione di passaggi obbligati)

- **outdoors:**

O
OUTDOOR

## OUTDOOR PAVING
## STANDARD THICKNESS

HEAVY COMMERCIAL AREAS (malls, airports, places of worship, schools, museums, squares, hospitals, etc.)
COMMERCIALI PESANTI (mall, aeroporti, luoghi di culto, scuole, musei, piazze, ospedali, etc.)

- for tiles sized **larger than 30 cm x 30 cm**;

to ensure a direct contact of 100% between the tile back side and the adhesive, **it is recommended to use the "backbuttering method"**.
This method consists in applying the adhesive both on the installation substrate and on the tile back side.

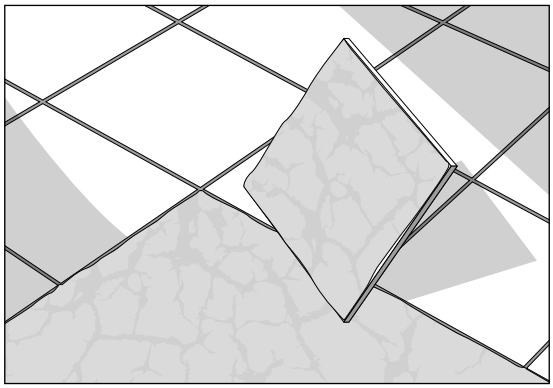


*Figure 10. Backbuttering method, substrate and tile back side application*

In case of backbuttering, for rectangular sizes and/or for boards, it is recommended to apply the adhesive linearly, in parallel to the short side of the tile.
It is essential that the directions for the application of the adhesive on the floor are parallel to those on the tile back side. This is important to avoid the formation of air bubbles under the tile.

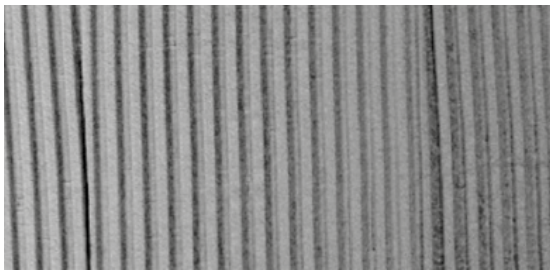


*Figure 11. Application of the adhesive in parallel to the short side of the tile*

## 1.3.2 Internal wall applications

In case of internal wall tile applications, the wetting must be 100% (using the **“backbuttering method”**) for walls tiled with:

- white body tiles sized larger than 30x30 cm;
- mosaics;
- porcelain stoneware tiles.

For white body wall tiles, if the substrate is not flat, to solve this problem it is absolutely recommended to apply a very homogeneous coat of adhesive in order to avoid the occurrence of “bending” of the ceramic material after the installation, as this could result in detached and/or broken installed slabs;

Obviously, it is always recommended to guarantee the flatness previously by using suitable levelling mortars (see paragraph 1.1.4).

## 1.3.3 External façades and/or wall applications

In case of external façades and/or wall applications the wetting must absolutely be 100%, only using the **“backbuttering method”**.

This application:

- avoids the creation of gaps on the interface between ceramic coating and rate. Indeed, in case of gaps rain water may seep, stagnate and possibly freeze, thus generating hazardous tensions that could even result in the **detaching of the tiles**.

*Figure 12. Tiles detaching*

- It evenly distributes - on a larger surface - the tensions resulting from the differential movements between the ceramic coat and the substrate, generated by thermal variations or settling movements of the structure.
- It reduced the risk of efflorescence from occurring on the façade.

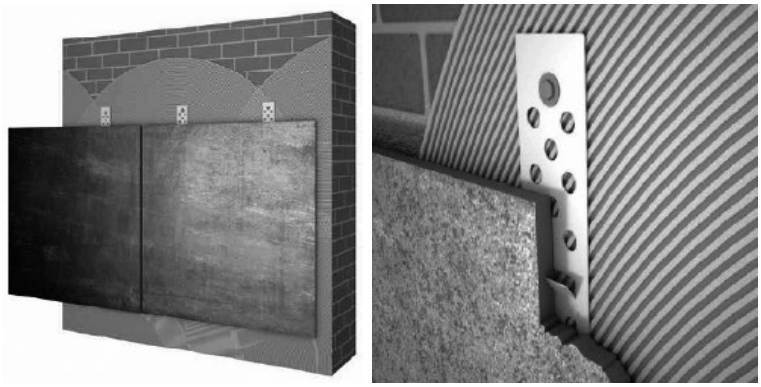
*Figure 13. Efflorescence (white pots)*

In external façade applications (with height from ground higher than 3 m) it is necessary to consider the differential movements that may occur between substrate and ceramic coat, mainly caused by thermal differences and thus depending on the exposure to the sun, the geographical area and even the tile colour (darker tiles have higher thermal expansion coefficients). These stresses, together with the need for supporting the weight of the same coat, make the assessment of the mechanical resistance of the substrate a must.
The norm UNI 11493-1 indicates some specifications that the substrate must meet:

- The substrate must have a bonding tensile strength (measured as adhesion of the bearing coat) of at least 1 N/mm$^2$ and a resistance to stresses parallel to the installation surface of ≥1.2 N/mm$^2$. If the substrate does not meet these requirements a new reinforced plaster with these characteristics must be applied and fastened to the structure.
- In case of masonry substrates (clay bricks, lightened blocks, etc.) direct installation is not allowed but it is necessary to apply a plaster with the previously specified strength characteristics.

**The installation on a previous coating is to be discouraged.**

- In case of tiles with side larger than 30 cm it is recommended to use an additional safety mechanical fastening to guarantee the holding of the tile should it accidentally detach.



The number of fasteners to be applied on the tile as the relevant type are to be chosen depending on the weight of the tile, the height of the coat and the site conditions.

## 1.4 TILE INSTALLATION

### 1.4.1 Storage and handling

No special measure is necessary for storage, except protection against impact which may break the material.
It is advisable to keep the product in its original package until it is used, if possible well covered in the case of open, outdoor exposure for long periods.
Precautions for handling:

- for **monoporosa** ground wall tiles, be very careful not to hit the edges which are very fragile;
- for **lapped** tiles, be very careful when taking them out of a box, strictly preventing the back side of a tile from rubbing the top surface of the one positioned below, so as not to scratch the ceramic tile irreparably before using it.

Safety gloves must be worn to prevent accidental injuries due to any breakage of pieces inside the boxes.

Avoid excessive effort in manual handling: therefore, always read the max. weight of the box before lifting it.

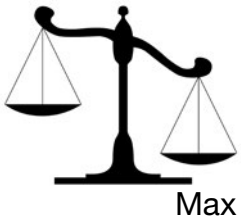



*Figure 14. Symbol of the max. weight indicated on each box*

### 1.4.2 Recommendations before installing the tiles

The installer, namely the professional operator who carries out this intervention and who “sees” and “handles” the tiles first, before the installation must inform the client and the designer of any possible evident fault (regarding quality,shade, etc.) in the ceramic material.

*Figure 15. Identifiable faults*

**Given that deshading is a typical characteristic of several ceramic products, it is necessary to check and be aware of the degree of deshading (V-SHADE) of the tiles to be installed.**

**V1**

Uniform appearance
Aspetto uniforme
Aspect uniforme
Gleichmäßiges Erscheinungsbild
Aspecto uniforme
Однородный вид

**V2**

Slight variation
Variazione minima
Variation minimale
Leichte Abweichung
Variación mínima
Минимальная
Неоднородность

**V3**

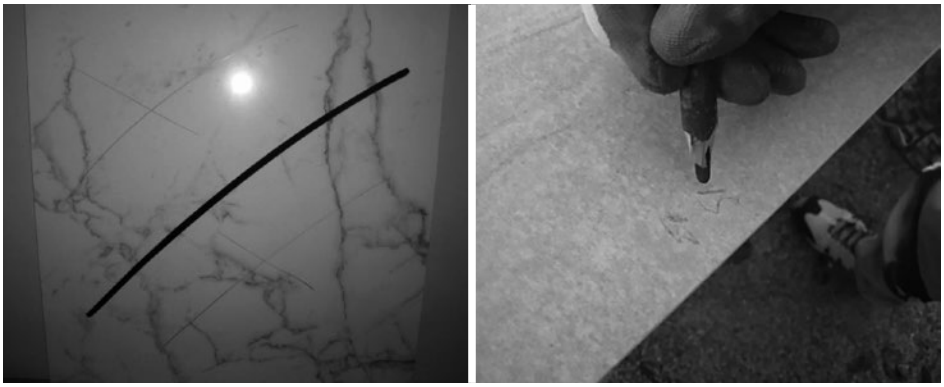
Moderate variation
Variazione moderata
Variation Modérée
Mäßige Abweichung
Variación moderada
Умеренная
Неоднородность

**V4**

Substantial variation
Variazione sostanziale
Variation substantielle
Grundlegende Abweichung
Variación sustancial
Значительная
Неоднородность

*Figure 16. Degree of deshading, General Catalogue*

**In case of installation of lapped and/or polished tiles, do not mark the working surface with indelible felt pens and/or pens for the cuts.**

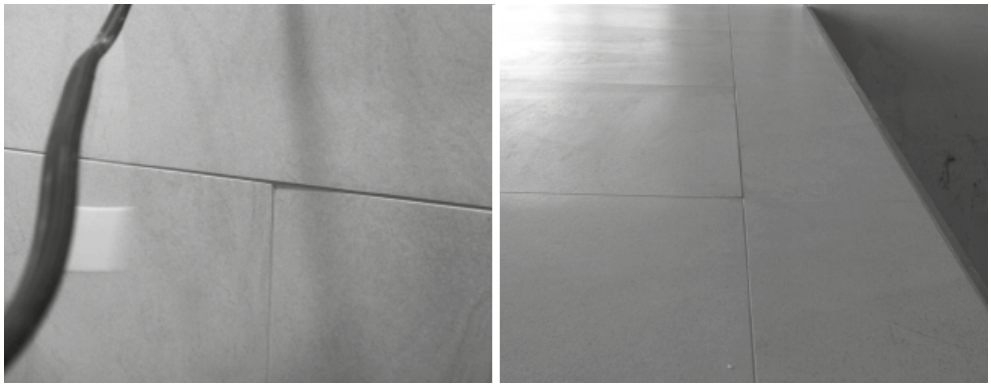


Even if it is not necessary to wet the tiles before the installation, in case of very dusty back sides it is anyway recommended a “quick” washing in clean water.

## 1.4.3 Recommendations for the installation during the tile installation

During the installation we recommend taking the tiles from different boxes to get the best chromatic effect.

**The installer must acknowledge possible faults (presence of steps or small level differences between adjacent tiles, ...) in the ceramic tiling during the procedure, and possibly ask for an authorisation to continue the work in writing from the final client or from the work manager.**



**The final client shall ensure, as far as he is concerned, micro-climate and lighting conditions to guarantee the possibility for the installer to carry out the installation in a reliable way, thus checking the materials and the works in progress, as previously described.**
**In the period between the installation end and the delivery to the final client, the ceramic tiling shall be:**

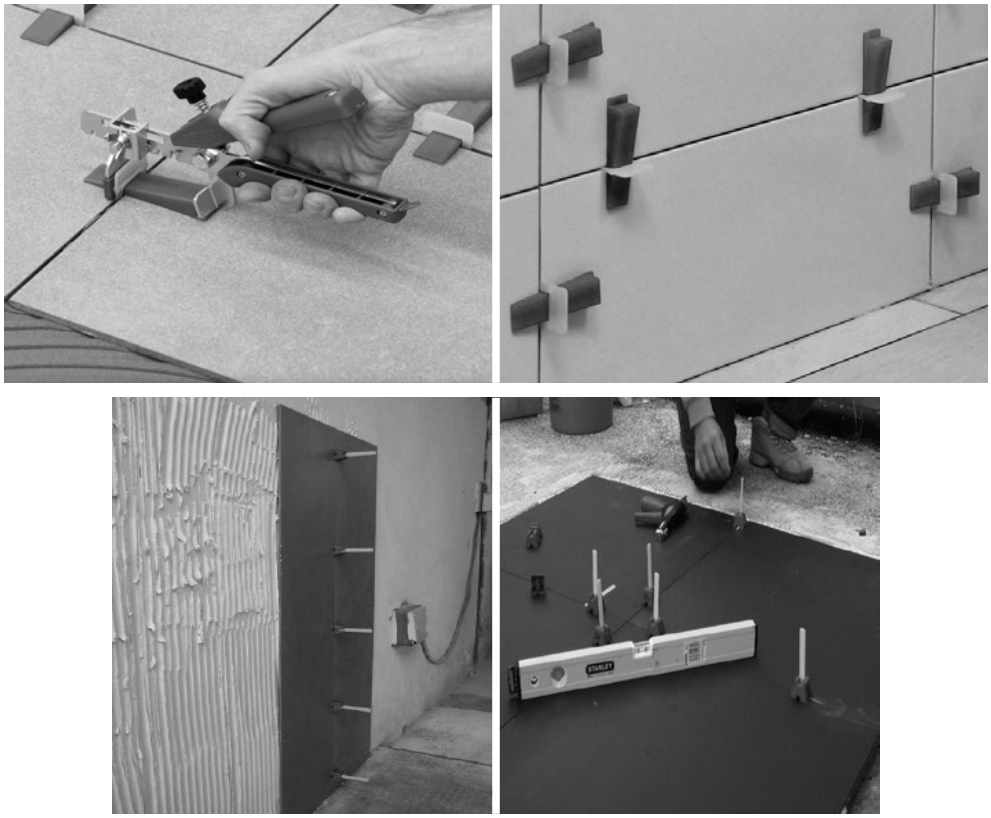
- **kept clean and free of cement, sand, mortar and any other material that could cause stains and/or surface mechanical abrasion;**
- **protected against damage or contamination potentially due by other involved building operators (painters, electricians, carpenters, etc.).**

For the first installed tiles it is always necessary to check their flatness with a level, tile by tile and row by row, both horizontally and vertically.

A level line which is perfectly flat must always be created,
avoiding level differences between tiles that must be eliminated immediately with one of the following techniques:

- pressing with fingers;
- light beating with a rubber hammer;
- adding or removing adhesive in the points where it is missing;
- **assisted installation systems with spacers and levellers.**

**Atlas Concorde absolutely recommends the use of these “assisted installation systems” available in different versions on the market for the installation of large sizes (side ≥ 60 cm) both on floors and walls, besides for the installation of rectangular tiles and/or boards.**



We recommend adopting all suitable measures for the installation of wall tiling in ground white body with these systems, as in certain cases chips on the installed slab edges may occur above all when tensioning the tie rods with grippers:

Furthermore, Atlas Concorde always recommend to use levellers in good condition and clean because scratches may occur during the levelling, especially for honed tiles, often due to the presence of external blunt bodies on the contact surface with the tile, such as worn plastic material.

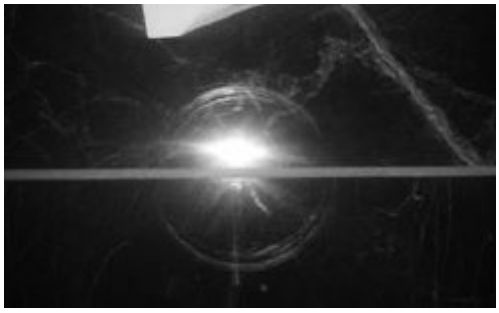
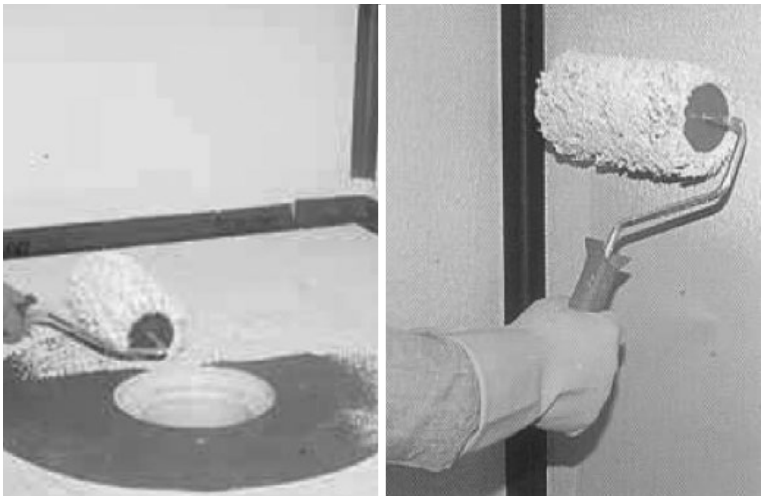


*Figure 17. Scratches on honed tiles due to durty livellers*

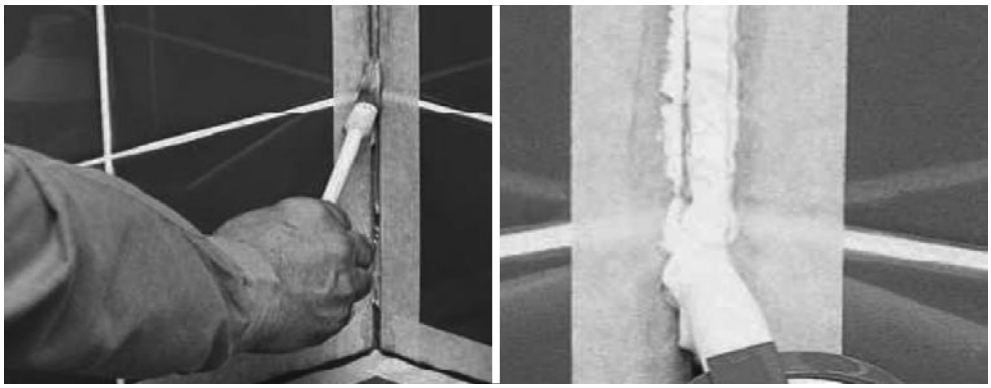
In **external floor applications**, to make the downflow of deposited water (rain and/or washing water) from the tiles easier, it is very important to give the trampling surface a sloping of at least 2% towards the water collection points.

**Masonry walls in very humid places** such as showers, saunas, spas, thermal centres and swimming-pools, must be protected against water seepage by a waterproofing coat.
The water-repellent coat can be obtained with liquid water-proofing products:

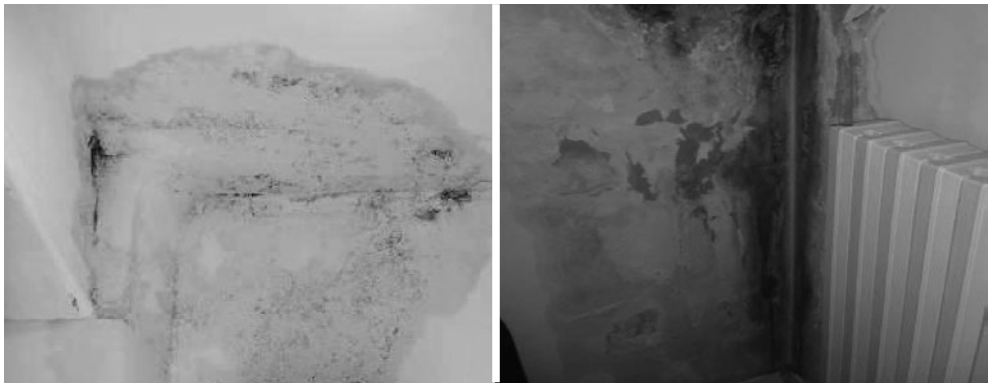


or with membranes in sheets:

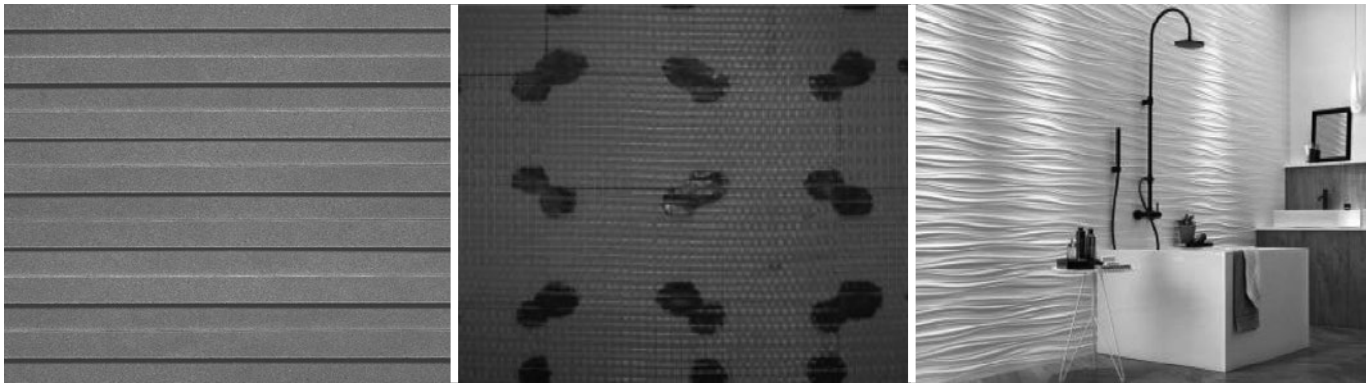
The use of the indicated products must be combined with a careful sealing in the joints with the floor and/or the shower and in all internal/external corners with silicone sealant, such as Mapesil AC-Mapei, after having applied a fixing primer, such as PRIMER FD-MAPEI.



This will avoid humidity, that is any mildew in the premises below and/or nearby.



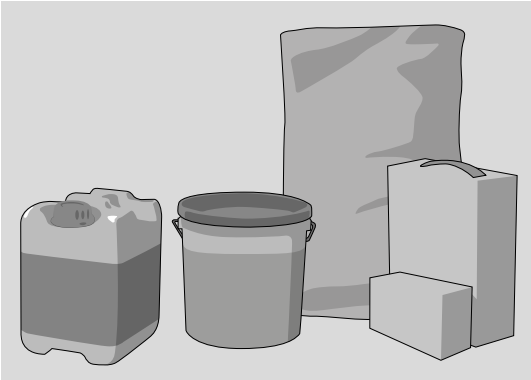
When coating the walls of humid places with tiles or mosaics (installed on fibreglass mesh) with 3D effect mostly installed by the customer and/or designer **without joints** (for aesthetic reasons):



it is necessary to arrange:

1) Coat for waterproofing and sealing the sanitary-ware (shower base) or the wall-floor joints according to the previous indications and absolutely “perfectly”;
2) Use of a two-component polyurethane adhesive (class R2T according to EN 12004) such as ULTRABOND ECO PU 2K – MAPEI to prevent any efflorescence from occurring:

**Internal tiling in swimming-pools** must be designed considering special levels of exposure to mechanical, thermal-hygrometric and chemical stresses; levels connected with the continuous contact with water (even in winter) and with the sanitation steps that are mandatory.
The sturdiness and durability of the tiling substrate, as well as the durability of the substrate/adhesive and adhesive/tile interfaces, are conditions necessary for the durability of the ceramic tiling exposed to the peculiar conditions mentioned above.
Before installing the tiles check the pool sealing.
The compactness of the adhesive coat ("full spreading") must be guaranteed by suitable technical solutions, such as the "double spreading".
Adhesives and grouting materials must be selected according to the indications needed for the durability of the ceramic tiling exposed to the peculiar conditions mentioned above; contact MAPEI S.p.A. technical office for any specific information on the type of products to be used and their installation.



WARNING:
ATLAS CONCORDE, WHEN THE MATERIAL IS INSTALLED ALREADY:

- DOES NOT ACCEPT ANY CLAIM FOR EVIDENT FAULTS OF SHADE AND SORTING;

- IS NOT RESPONSIBLE FOR THE QUALITY OF THE FINISHED TILING, RATHER ONLY ON THE CHARACTERISTICS OF THE MATERIAL SUPPLIED.

IT IS THEREFORE RECOMMENDED, AT THE END OF THE INSTALLATION, TO KEEP SOME SPARE TILES FOR POSSIBLE REPAIRS, OR EVEN TO HAVE A REPRESENTATIVE SAMPLE OF THE MATERIAL THAT SHALL BE DELIVERED TO US IN CASE OF CLAIMS SO AS TO CARRY OUT ALL DIMENSIONAL CHECKS ACCORDING TO THE NORMS IN FORCE AT EXTERNAL CERTIFIED LABORATORIES.

## 1.4.4 Dry installation of LASTRA 20mm

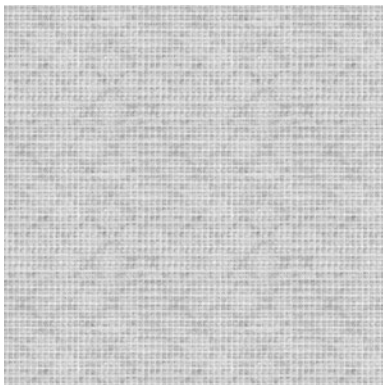
Please see the section LASTRA 20mm of the website www.atlasconcorde.com or the LASTRA 20mm catalogue for more information and recommendations on the installation.

**WARNING FOR CLIENTS/DESIGNERS**

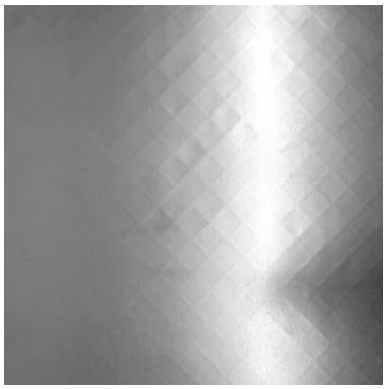
If the application of 20 mm slabs involves using the ceramic product structurally, we recommend to the designer and/or client a careful evaluation of the project according to the technical characteristics of the slabs.

In particular, to prevent the risk of injuring people and damaging property, the manufacturer recommends:

- If the installation involves the raised installation, considering that a tile could break if a heavy body falls on it, check in advance the specific final use and respect the instruction table for raised installation here below where, in certain conditions, the application of a reinforcement on the tile back side (double mesh in fibreglass or in galvanised steel) supplied by the manufacturer is envisaged.



*Glass fiber double mesh*



*Galvanized steel sheet*

- With reference to a flooring installed raised, with any system of dry installation, comply with the specific local norms in force and use conditions which regard, among others and as an example, the action of wind, the structural load, seismic actions, etc.

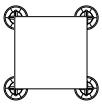
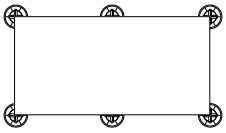
Failure to comply with the recommendations above may result in an improper use of the product and possibly cause severe injuries to people and damage to property.

### 1.4.4.1 Raised installation of LASTRA 20mm

**For all markets, North America and Oceania excluded.**

**Size 60x60.** For the raised installation of slabs 60×60 with 20 mm thickness, we recommend a max. raising from the trampling surface not higher than 10 cm.
Anyway, it is possible to install slabs 60×60 with 20 mm thickness at heights over 10 cm after applying in the lower side of the slab a double fibreglass mesh or a galvanised sheet steel for **raised installations up to 30 cm**.

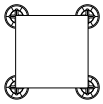
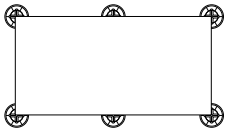
**Sizes 45x90 – 30x120 – 40x120 – 60x120.**
The sizes 45×90, 30x120, 40x120 and 60x120 with 20 mm thickness are considered suitable for the installation on screed, gravel, sand, grass or substrates at a max. height of 2 cm using 6 supports/slab so as to distribute the loads uniformly. For a **raised installation between 2 and 30 cm** it is necessary to apply in the lower side of the slab a double fibreglass mesh or a galvanised sheet steel.

| SIZE | | UP TO ¾” (2CM) | FROM ¾” (2CM) TO 4” (10CM) | FROM 4” (10CM) TO 12” (30CM) |
|---|---|---|---|---|
| 24”x24”<br>60x60cm (Nominal)<br>4 supports per slab |  | 4 SUPPORTS<br>(3,4 pcs/m$^2$) | 4 SUPPORTS<br>(3,4 pcs/m$^2$) | 4 SUPPORTS DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET (3,4 pcs/m$^2$) |
| 18”x36”<br>45x90cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(6,0 pcs/m$^2$) | 6 SUPPORTS (6,0 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET | 6 SUPPORTS (6,0 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET |
| 12”x48”<br>30x120cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(7,0 pcs/m$^2$) | 6 SUPPORTS (7,0 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET | 6 SUPPORTS 7,0 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET |
| 16”x48”<br>40x120cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(4,5 pcs/m$^2$) | 6 SUPPORTS (4,5 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET | 6 SUPPORTS 4,5 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET |
| 24”x48”<br>60x120cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(3,4 pcs/m$^2$) | 6 SUPPORTS (3,4 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET | 6 SUPPORTS (3,4 pcs/m$^2$)<br>DOUBLE GLASS-FIBRE NET OR GALVANISED STEEL SHEET |

**For North America and Oceania markets.**

**Size 60×60.**
For the raised installation of slabs 60×60 with 20 mm thickness, we recommend a max. raising from the trampling surface **not higher than 2cm.**

**Sizes 45x90 – 30x120 – 40x120 – 60x120.**
The sizes 45x90, 30x120, 40x120 and 60x120 with 20 mm thickness are considered suitable for the installation on screed, gravel, sand, grass or substrates at a **max. height of 2 cm** using 6 supports/slab so as to distribute the loads uniformly.

| SIZE | | UP TO ¾” (2CM) | ABOVE ¾” (2CM) |
|---|---|---|---|
| 24”x24”<br>60x60cm (Nominal)<br>4 supports per slab |  | 4 SUPPORTS<br>(0,32 pcs/sq ft) | PLEASE CONTACT YOUR ATLAS CONCORDE SALES REPRESENTATIVE |
| 18”x36”<br>45x90cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(0,56 pcs/sq ft) | |
| 12”x48”<br>30x120cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(0,65 pcs/sq ft) | |
| 16”x48”<br>40x120cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(0,42 pcs/sq ft) | |
| 24”x48”<br>60x120cm (Nominal)<br>6 supports per slab |  | 6 SUPPORTS<br>(0,32 pcs/sq ft) | |

Please note that on any tile in porcelain stoneware for external applications, installed “dry” or with the inclination adhesive technique, a thin water film tends to be kept after a weather event, due to the “surface tension” of this liquid combined with the surface non-absorbency of this type of ceramic material:

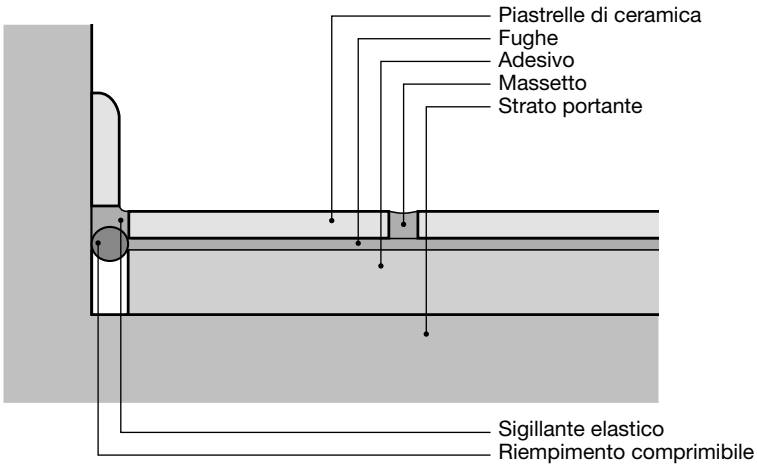
To eliminate this film and let the floor dry completely and correctly it is recommended:

1) To sweep the water with a brush broom towards the direction of the joints (in case of dry installation) or towards the water collection points (in case of adhesive installation);
2) To use a liquid vacuum cleaner sucking all the stagnating water on the surface of the tiles, whose drying time will depend on the weather and/or environmental conditions at their installation.

## 1.4.5 Installation of trims

### 1.4.5.1 Skirting board

Skirting boards must be fixed to the vertical support with adhesive so as to leave a distance **of at least 2 mm** from the floor tile.
After the installation, and before the grouting, this distance must be manually sealed with permanently elastic material or, as alternative,with a prefabricated system integrated into the perimeter joint to be arranged all along the **room perimeter** and around pillars, columns, raised planes, interposing compressible material such as **foam polystyrene** with a thickness of about 1 cm.

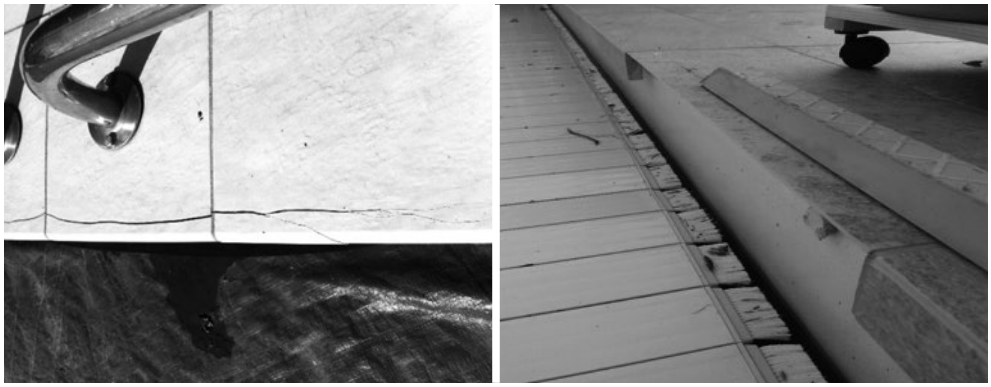


## 1.4.5.2 L-shaped elements and steps

In order to avoid breaking L-shaped elements, monolithic and/or bonded steps and their corner elements, it is recommended to follow the instructions below:

- **At the installation, leave a movement space of 3-4 mm to the bull nose - meaning by bull nose the end ceramic piece that form the vertical profile or drop.**

This space, indicated with letter A in Figure 18, is aimed at avoiding any breakage of the bonded piece because of settlement (due to failures) or expansion of the structure following to remarkable temperature changes.



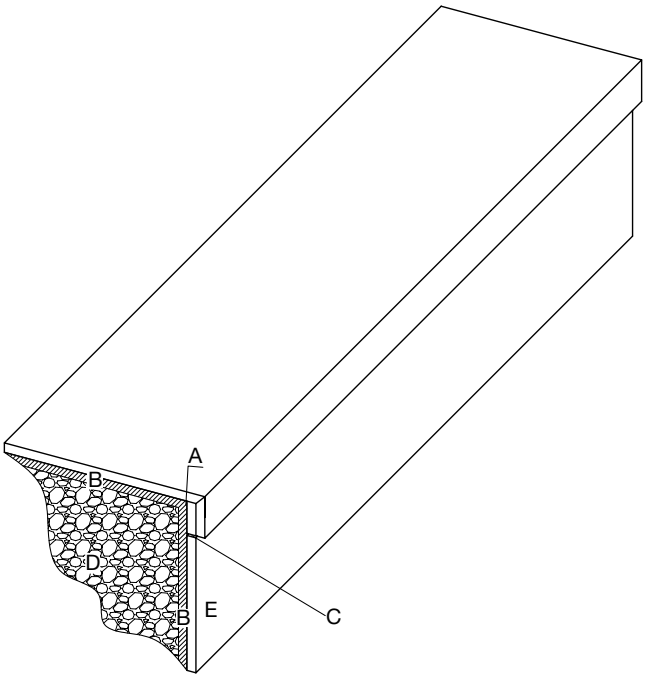



*Figure 18. Step section.*

- It is also recommended to grout the joints regarding the bull nose (detail C in Figure 18) with a two-component, elastic polyurethane joint with extension in operation up to 5%, such as MAPEFLEX PU21-MAPEI;

- It is advisable to avoid gaps of adhesive or mortar in the inner corner area (as indicated by letter A in Figure 18).

In case of concrete substrate (as indicated with letter D in Figure 18), it is recommended, as adhesive (letter B) for both the riser and the tread (letter E), to use deformable or highly deformable cementitious adhesives (class S1 or S2 – EN 12004), such as those in Table 1 in the section “external floor applications” with the “backbuttering” method by applying the adhesive both on the substrate and on the tile back side.

## 1.4.6 Cutting operations on site

### 1.4.6.1 Linear or transverse cuts

The tools for making **linear or transverse cuts** (with any angle) depend on the type of ceramic material:

- **glazed ceramic** (monoporosa in white body or glazed porcelain stoneware)
- **full coloured body porcelain stoneware**

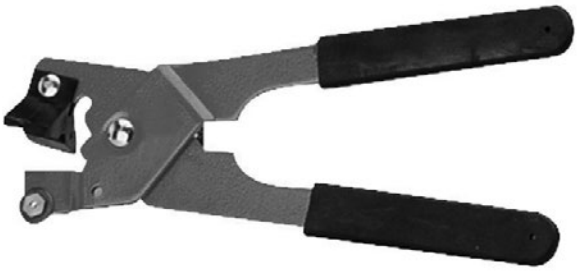
Glazed ceramic

To cut it, it can suffice to use **manual tile cutters** with a separation power > **800 kg**

with **adjustable wheel** with diameter:

- **6 mm – 10 mm** for monoporosa in white body
- **10 mm – 18 mm – 22 mm** for glazed porcelain stoneware

For any accurate cut-out of tiles in white body you can use standard **pincers for ceramic**.



**Full coloured body porcelain stoneware**
To cut it, it is advisable to use manual tile cutters with a separation power

- > 1000 kg for thickness up to 1 cm:

- > 1500 kg for thickness up to 2 cm (20 mm SLAB)

with **adjustable wheel** with diameter >= 18 mm:

for any accurate cut-out of tiles use **special pincers for hard materials** or **pincers for porcelain stoneware**.

If the best cut cannot be obtained using dry manual tile cutter, for any type of ceramic material and for thickness **up to 1 cm**, it is recommended to use **electric cutters with water cooling** or **dry angle grinders** with **continuous band diamond disc**. For **higher thicknesses** it is recommended to use only electric cutters with water cooling.



The recommended rotation and feeding speeds follow here:

- Rotation speed: 2500 spins/min
- Feeding speed: < 1 m/min

It is also recommended to **halve** the feeding speed close to the tile **edges**.

## 1.4.6.2 Circular drilling

The tools for **circular drilling** depend on the type of ceramic material:

- **glazed ceramic** (monoporosa in white body or glazed porcelain stoneware)
- **full coloured body porcelain stoneware**

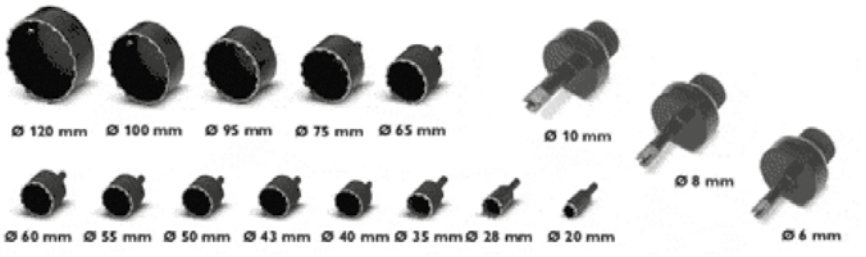
and if such drilling is carried out **before or after the installation**.

**Glazed ceramic**

For circular drilling of glazed ceramic **before installation**, it is recommended to dry-use cups/cutters which can be mounted on a standard electric drill, not impact type (recommended max. speed 800 rpm), in the non-glazed section of the tile.

For circular drilling of glazed ceramic **after installation**, it is recommended to dry-use bits for masonry or concrete which can be mounted on a standard electric drill, not impact type, taking care to engrave the drill starting point on the glazed surface of the tile with the tip of a screwdriver.

**Full coloured body porcelain stoneware**
For circular drilling of porcelain stoneware **before installation**, it is recommended to use diamond cutters with water cooling on the top surface of the tile, which can be mounted on a standard electric drill, not impact type (recommended max. speed 900 rpm for thickness up to 95 mm and 450 rpm for higher thickness), possibly equipped with a suitable guide.




For circular drilling of porcelain stoneware after installation, it is recommended to use removable diamond cutters with water cooling which can be mounted on a standard electric drill, not impact type (recommended max. speed 1800 rpm) with sucker fixing so that vertical holes can be drilled in the set point, avoiding any movement of the cutter.

Atlas Concorde also recommends drilling circular holes using water cooling.

## 1.4.6.3 Rectangular drilling

Irrespective of the type of ceramic material, it is recommended to drill a circular hole close to the cut vertices according to the instructions of § 1.4.6.2 initially and, later, to connect them through linear cuts, according to the instructions of §1.4.6.1, thus relaxing tensions on the vertices of the cut tile.

## 1.4.6.4 Shaping in contact

For shaping or joining the floor or wall tiling close to interruption elements such as walls, pillars, etc... all recommendations previously mentioned for cutting and drilling shall be applied. All along the room perimeter and around pillars, columns and over-elevations of the floors pay attention if a square angle cut of the tile is required, avoiding post-installation cracks of the ceramic material, as inner tensions are very likely to build up there, and therefore cracks to develop subsequently (see Figure 19).

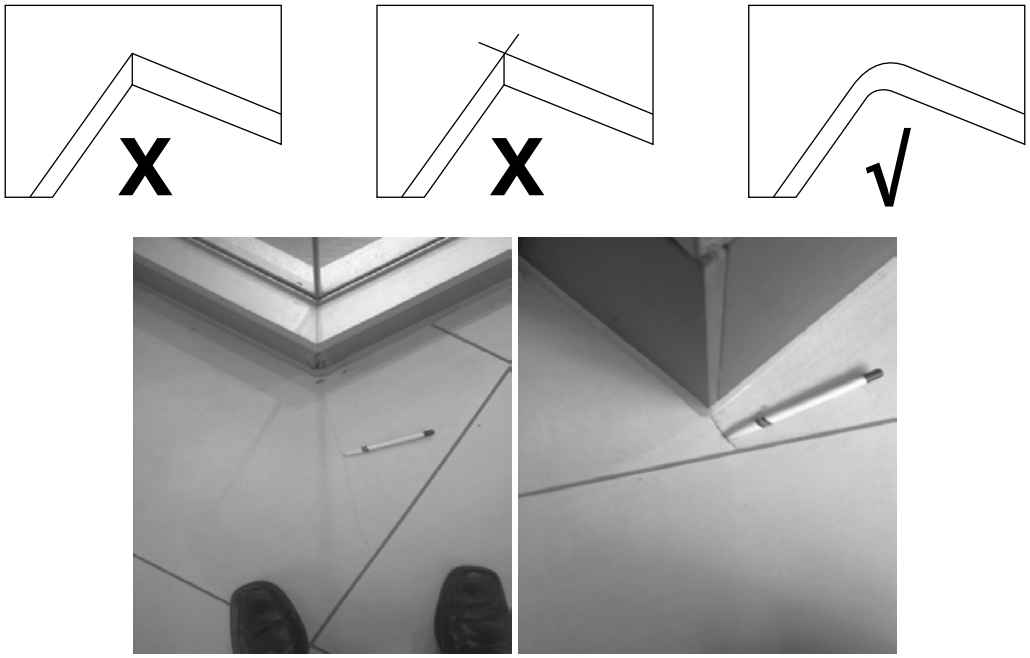



*Figure 19. Cracks due to square angle shaping*

## 1.4.6.5 Hazard identification

The product is inert and does not involve any hazard to health or the environment in its standard use.
Dust with suspended particles of respirable crystalline silica ($SiO_2$) may be released while cutting; therefore it is recommended to carry out these operations with wet methods or using manual dry tile cutter in a ventilated place.
Any exposure to dust in the case of dry cutting with grinder must be controlled and reduced as much as possible using forced ventilation and/or suction systems.

**Precautions for people:**

**Respiratory tract protection:**
Use proper means of respiratory tract protection.

**Eye protection:**
Use goggles against the projection of tile splinters or and/or parts.

**Hand protection:**
It is recommended to wear mechanical protection gloves to avoid accidental cuts due to any breakage of pieces.

Atlas Concorde tiles are neither flammable nor combustible.

In the case of nearby fires, there is no restriction on the means of extinguishing to be used.

## 1.5 JOINTS AND GROUTING

The installation pattern is defined by these factors:

- joint width;
- alignment of the joints to the surface reference axis;
- joint path.

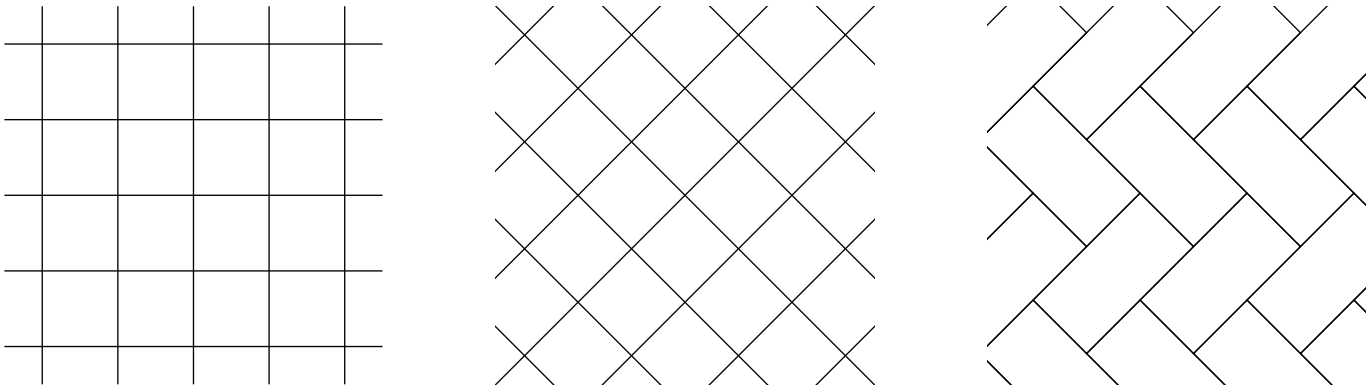
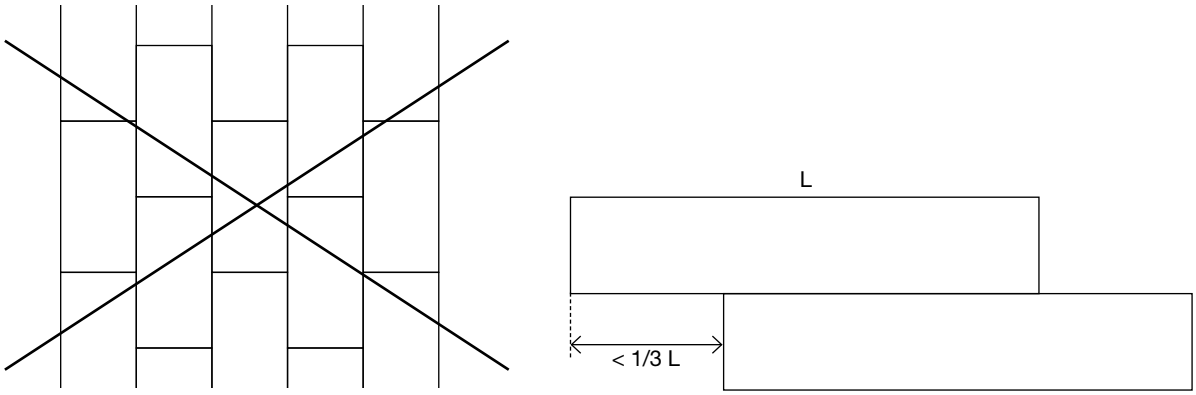


*Figure 20. Typical joints patterns*

**For the installation of boards and/or rectangular sizes it is recommended, in case of "continuous" installation, to install the boards staggered at max. 1/3 of the length of the longer side.**




**While designing an installation pattern the manufacturing dimensions (in mm) of the tiles (WS) associated with the "gauge" must be considered, rather than the nominal dimension (in cm) associated with the size or dimension of the tiles.**

**The installation with joined joint is absolutely advised against.**
In the design step, the width of the joints must be defined mainly according to:

- the dimensional characteristics of the tiles (ground and/or non-ground tiles);
- the type of substrate;
- the final use of the material (internal/external floor application or internal/external floor application);
- the presence of norms and/or regulations for the installation in force in the country where the ceramic material will be installed.

For the **installation of pre-cut mosaics and/or tiles** pay the utmost attention to the dimension of the joints to be maintained between the various "sheets" and/or ceramic tiles to avoid any discontinuity between the joints of the tesserae in the various mosaic sheets and/or the shape of each single pre-cut tile when the work is completed:

It is recommended to fill the joints with specific coloured products, with low grain size, as they offer remarkable advantages when compared to cheaper grouts with sand and cement:

1) The possibility of chromatic matching with the ceramic material; upon request, we are available to indicate a grout colour code according to the item to be installed;
2) A lower porosity and thus a lower tendency to hold dirt, the possibility of settling perfectly inside the joints.

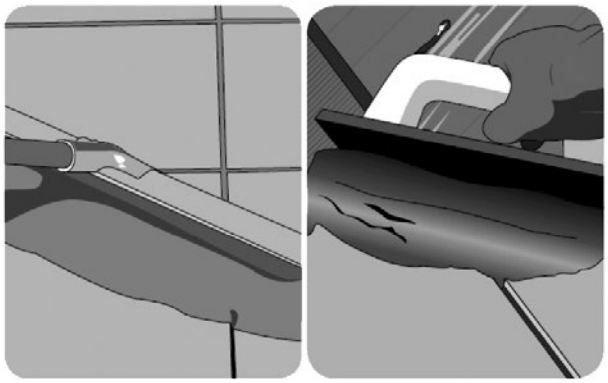
The **choice of the grout type** mainly depends on the destination place of the ceramic material; in Table 3 there is a brief classification of the grouts depending on the final uses.

| FINAL USE | RECOMMENDED GROUTS<br>European Norm EN 13888 |
|---|---|
| Indoor residential premises | Improved cementitious mortars for joints (class CG2WA).<br>Type: KERACOLOR FF, KERACOLOR GG, KERACOLOR SF, ULTRACOLOR PLUS |
| Outdoor and indoor humid premises (bathrooms, showers) | Improved cementitious mortars with reduced water absorption (class CG2 WA). Type: KERACOLOR FF, KERACOLOR GG, ULTRACOLOR PLUS (OR CLASS RG), KERAPOXY CQ, KERAPOXY DESIGN |
| Commercial premises | Improved cementitious mortars with high resistance to abrasion (class CG2 A).<br>Type: KERACOLOR FF, KERACOLOR GG, ULTRACOLOR PLUS (OR CLASS RG1), KERAPOXY CQ, KERAPOXY DESIGN |
| Premises with requirements of max. hygiene and resistance to chemicals (swimming-pools, worktops for kitchens, food industries, hospitals, supermarkets, etc.) | Epoxy mortars (class RG).<br>Type: KERAPOXY, KERAPOXY CQ, KERAPOXY DESIGN, KERAPOXY IEG |

*Table 3. Classification of the grouts according to the final use*

For a correct and easy application and removal of grout excesses it is recommended to follow the indications of the grout manufacturer.

The grouting of joints between the tiles must be made with the suitable trowel or a rubber, without leaving gaps or height differences.



On the floor, grouting must be carried out at least after:
- 24 HOURS, in case of standard setting adhesives
- 3-4 HOURS, in case of rapid setting adhesives

The grouting of joints between tiles on walls must be carried out at least after:
- 4-8 hours, in case of standard setting adhesives
- 1-2 hours, in case of rapid setting adhesives.

## 1.5.1 Removal of grout excesses

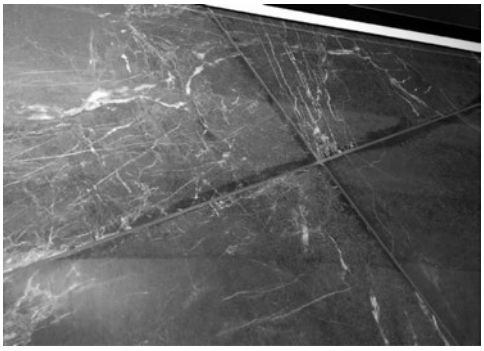
To make the **cleaning at the end of site operations** easier it is extremely important to remove the grouting excesses as first step of the cleaning procedure after having grouted the ceramic tiles.
For a correct and easy removal of grout excesses it is recommended to follow the indications of the grout manufacturer; generally, follow the instructions below.

### 1.5.1.1 Cementitious grouts (Class CG – EN 13888)

Remove the grout excess from the surface, moving the squeegee or trowel diagonally to the joints, with the mix still fresh.
Clean the grout residue only when the mix is not plastic anymore, usually after 10-20 minutes (**5 minutes in case of relief, micro-relied and/or grip finishing**), with a wet sponge made of hard cellulose, wiping diagonally to the joints;

Rinse the sponge frequently, using two different containers for the water: one to remove the mix excess from the sponge and the other with clean water, for rinsing the sponge. When the material is dry, rinse with clean how water.
For large surfaces, use a machine with sponge belt.

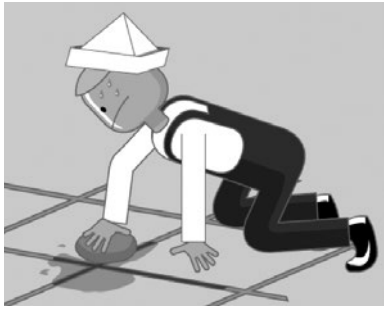
CAUTION:
**If cleaning is made too early (with mix still plastic) the joints can be partially emptied and are more subject to colour variations. On the contrary, if the grouting has hardened already, it is necessary to use a wet Scotch-Brite pad to remove the grout from the tiles more easily.**
**For the "contrasting" grouting (for example, white grout with black tiles and/or vice versa) of lapped and/or polished finishing:**



**always make preliminary cleaning tests on a few samples, possibly not installed yet, or on an installed part which is not visible.**

### 1.5.1.2 Epoxy grouts (Class RG – EN 13888)

With the mix still fresh, wet the surface abundantly emulsifying with a Scotch-Brite pad (white for cleaning lapped, polished and/or glazed glossy finishing, or coloured for all the other finishings), caring not to empty the joints.
The liquid residue of grout must be removed with a hard cellulose sponge (to be replaced if too much impregnated with resin) which will be used also for the final levelling of the grouting.
It is essential to remove the epoxy grout **quickly** before it starts to harden, as its removal later would be very difficult; if the epoxy grout has started already to harden try to add 10% of ethyl alcohol to the washing water.



CAUTION:
To grout finishings:

- lapped and/or polished;
- glazed decorations and/or mosaics with light relief surface

always make preliminary cleaning tests on a few samples, possibly not installed yet, or on an installed part which is not visible.

It is absolutely advised against to use epoxy grouts with relief, micro-relief and/or grip finishings.

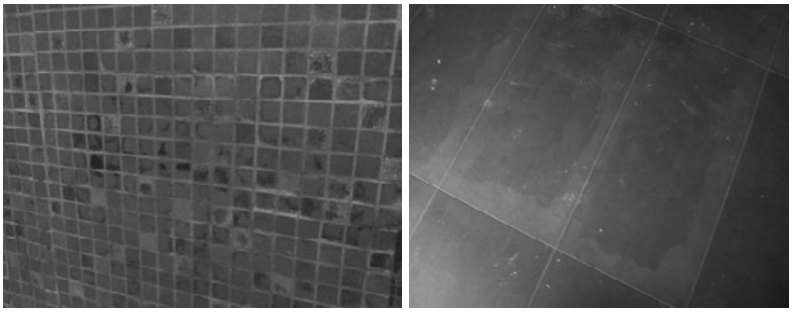


*Figure 21. Bad cleaning with epoxy grouts*

## 1.6 EXPANSION JOINTS

The term "**expansion joint**" indicates every interruption in the continuity of the floor system, made to enable dimension variations and strains of the surface, when required by structural and architectural reasons.
Joints with these functions can be basically classified in:

1) **PERIMETER JOINTS**: made to insulate the ceramic tiling from the nearby building elements (walls, pillars, columns, etc.); all along the whole perimeter of the room compressible material such as foam polystyrene with a thickness of about 1 cm is interposed (see the installation of SKIRTING BOARDS, § 1.4.5.1);
2) **SECTIONING JOINTS**: made to limit the mechanical stresses (hygrometric shrinkage) that may affect the flooring; they involve even 1/3 of the screed;
3) **EXPANSION JOINTS**: made to limit the mechanical stresses (shrinkage to divide tiling with large area in smaller areas which are usually square).

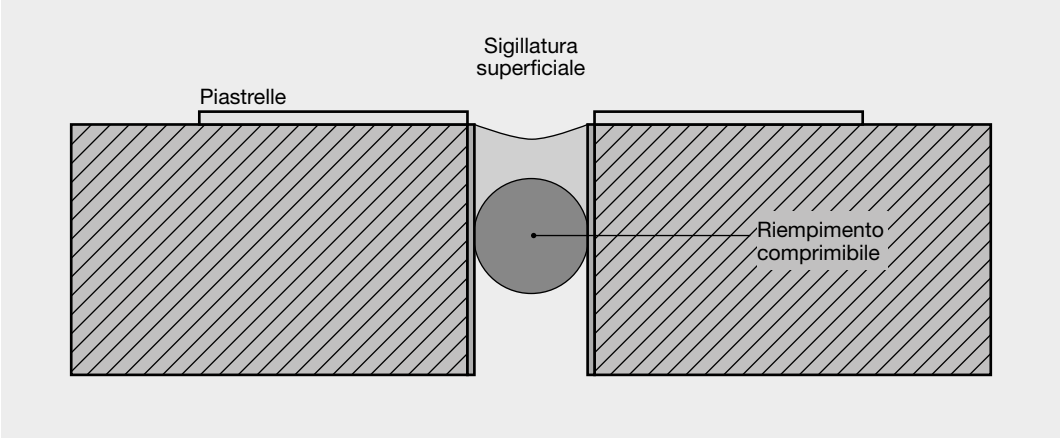
The latter two types of joints are usually required in:

- **INDOOR PREMISES**, to realise large surfaces and, in particular, in the use sector defined here below "commercial" at least every **20-25 m²**, while they are almost NEVER required in the "residential" sector, due to the limited areas of the rooms;
- **OUTDOOR PREMISES**, at least every **9-12 m²** and in particular in external façade they must always be arranged next to corners, openings (doors, windows) and string-course bands..

Anyway, they must generally be between 5 and 12 mm wide.
The pattern of the joints must be realised in the design step, so as to cover a square or rectangular surface with a ratio between the sides possibly lower than 1.5.
The dimensions according to the final uses are:

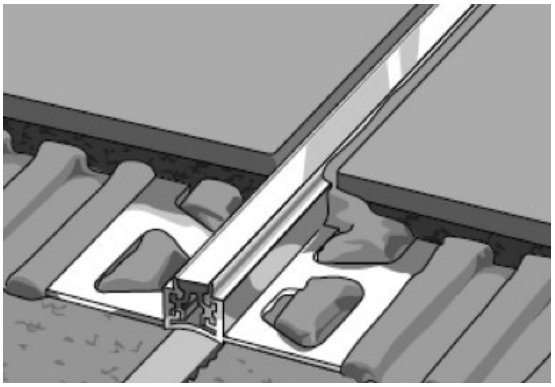
- **5 m x 5 m or 6 m x 4 m for INDOOR PREMISES;**
- **3 m x 3 m or 4 m x 2.5 m for OUTDOOR PREMISES.**

Expansion joints must always be arranged next to structural joints and can be:
1) "made on spot":




A compressible filling (for example, a strip of foam polystyrene or polyurethane) with dimensions not filling the whole depth of the joint and ensuring the availability of a sufficient space for the expansion of this filling along the joint depth, following to an (expected) width decrease due to the relevant (approaching) movement between the parties separated by the same joint.
A surface sealing (generally based on silicone or polyurethane) made with a permanently elastic material to be selected according to the final use and to the technical characteristics indicated by the manufacturer.
The use of a silicone sealant, such as MAPESIL AC – MAPEI, is recommended in expansion joints.
For internal and large sized floors where also sectioning joints are to be arranged, it is recommended to use a two-component polyurethane sealant, such as MAPEFLEX PU20 – MAPEI (operating extension up to 10%) or MAPEFLEX PU21 – MAPEI (operating extension up to 5%).

2) pre-fabricated:



they must be selected based on their installation place and joint function and according to the technical characteristics indicated by the manufacturer.

## 1.7 TILING FINAL TEST

The tiling final test must be made by the final client before the installer and the site manager, through a visual inspection with the naked eye (wearing spectacles, if usually required) of the surface at a distance of 1.5 m.
An “effect” detected only by the side light and at a close distance, may be with the aid of a magnifying glass, cannot be considered a “defect”.
An “effect” becomes a “defect” when it is visible in the above specified observation conditions.

# 2 MAINTENANCE

**Atlas Concorde** cares for the quality of the services offered and for the relevant satisfaction of the customers.
This satisfaction does not finish at the purchase rather must last throughout the entire life of the ceramic material.
Tiles are subjected daily to the deposit of dirt and dust and to the staining action of food, drinks and other various substances, which alter their surface and jeopardise their aesthetic beauty.
A suitable maintenance of the material is therefore essential for the ceramic surfaces to keep their original aspect as long as possible.
For this reason, Atlas Concorde reserves to give a few simple instructions for a correct cleaning and maintenance of the ceramic material.
The steps to be carried out, their methods, the products and tools to be used for an effective and complete cleaning of the Atlas Concorde products, from the interventions immediately after the installation (site completion cleaning) until the ordinary and extraordinary maintenance are listed below (in some cases divided according to the surface finishing of the tiles).

## 2.1 SITE COMPLETION CLEANING

| TOOLS NEEDED FOR TILES WITH MATT FINISHING | |
|---|---|
| FOR CLEANING MANUALLY | FOR CLEANING LARGE SURFACES |
| broom, buckets, brush broom, rough cloth, green Scotch-Brite sponge | broom, buckets, single brush with green disk, liquid vacuum cleaner, cloths |

| TOOLS NEEDED FOR TILES WITH LAPPED AND/OR POLISHED FINISHING | |
|---|---|
| FOR CLEANING MANUALLY | FOR CLEANING LARGE SURFACES |
| broom, buckets, brush broom, rough cloth, white Scotch-Brite sponge | broom, buckets, single brush with white disk, liquid vacuum cleaner, cloths |

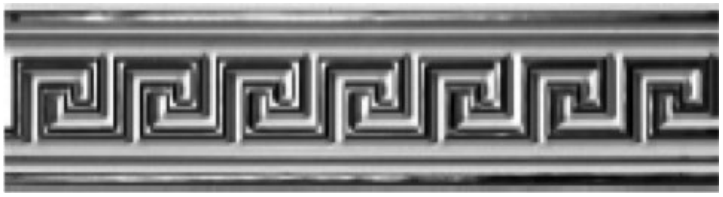
| TOOLS NEEDED FOR TILES WITH RELIEF, MICRO-RELIEF AND/OR GRIP FINISHING | |
|---|---|
| FOR CLEANING MANUALLY | FOR CLEANING LARGE SURFACES |
| broom, buckets, brush broom with medium-hard nylon bristles, brush in nylon with medium-hard bristles or abrasive sponge | broom, buckets, single brush with nylon brushes with medium-hard bristles, liquid vacuum cleaner, cloths |

| TOOLS NEEDED FOR GLAZED WALL TILES | |
|---|---|
| FOR CLEANING MANUALLY | FOR CLEANING LARGE SURFACES |
| sponge, white Scotch-Brite sponge, cloths | |

**The site completion cleaning is aimed at eliminating all the site residues (cement, mortar, grout, paint and any other material that may stain or abrade the ceramic material) on the ceramic tiling surface after the installation on site.**
**The care used in this first cleaning operation after the installation (generally made by the final client or by a professional cleaning firm) will influence the cleanability of the ceramic surface throughout its life: leaving residues means leaving dirt catalysers.**

*Figure 22. . Example of wrong cleaning. White stains due to dirty cleaning tools*

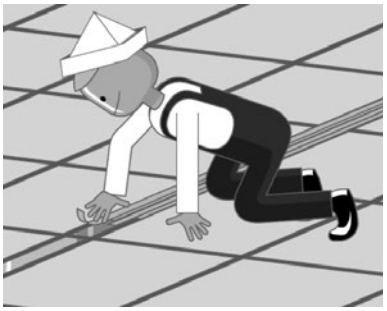
After the curing time of the **cementitious grout** (at least a few days in good weather conditions), clean with an **acid detergent**, such as **FILA DETERDEK**, or a **neutral detergent**, such as **FILA CLEANER, if there are tiles with "material" decorations** (gold-silver…).



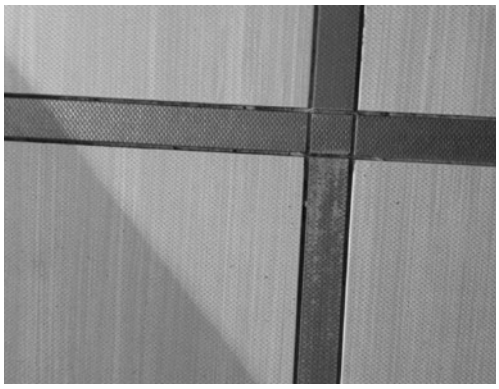
**The materials used for these decorations have special characteristics typical of precious metals; therefore, be very careful in the installation and above all in the cleaning, absolutely avoiding the use of abrasive pads that could scratch and damage their surface.**

It is necessary to strictly follow the use instructions and dilutions indicated on the package by the detergent manufacturer and to avoid, in case of acid cleaning, to use strong acids which are not specific for the ceramic material even if diluted, as they may release harmful fumes and have a corrosive and discolouring effect on the joints.

CAUTION:
If this cleaning is made after the floor has been used, before cleaning with the acid product remove possible greasy substances or similar using specific **alkaline-based detergents**, such as **FILA PS/87**.
It is important to protect in advance with adhesive tape any decoration IN CERAMIC or any insert in marble, granite, natural stones and metal, in contact with the ceramic tiling.



**Absolutely avoid to use iron or steel pads, as they could scratch the surface of all those tiles very sensitive to this stress.**



In case of **epoxy grouts**, to remove surface stains and halos use **detergents specific** for this type of organic residues, such as **FILA CR10**, following the indications by the manufacturer and strictly complying with the instructions below.

## 2.1.1. Method for cleaning residues of cementitious grouts (Class CG – EN 13888)

Atlas Concorde recommends using an acid solution (at the recommended dilution, in possibly hot water as this increases the effectiveness of the detergent) such as **FILA DETERDEK**, carefully following the instructions here below:

**QUANTITY AND APPROXIMATE DILUTION PERCENTAGE OF FILA DETERDEK ACCORDING TO THE SURFACE TYPE:**


| TILES WITH MATT, RELIEF, MICRO-RELIEF AND GRIP FINISH |
|---|
| 3 litres of acid solution every 100 $m^2$<br>in 1:5 dilution (1 litre every 5 litres of water) |

| TILES WITH LAPPED AND/OR POLISHED, GLAZED FINISH FOR WALL APPLICATIONS |
|---|
| 3 litres of acid solution every 100 $m^2$<br>in 1:10 dilution (½ litre of FILA DETERDEK every 5 litres of water) |

if there are **tiles with various decorations** use **neutral detergent**, such as **FILA CLEANER**.


**QUANTITY AND APPROXIMATE DILUTION PERCENTAGE OF FILA CLEANER:**

| PIASTRELLE CON FINITURA SMALTATA SENSIBILI ALLE SOLUZIONI ACIDE |
|---|
| 1 litro soluzione neutra per 100$m^2$<br>in diluizione 1:5 (1 litro in 5 litri di acqua) |

Sweep away from the floor any type of deposit or remove the possible dusty film from the wall surface with a dry and clean cloth.
Wet with water only cementitious grouts, so as to protect them from a possible corroding action of the diluted acid solution that will be used.
Evenly distribute the diluted acid solution (**or the neutral solution in case of decorations sensitive to acids**) with:

- ON THE FLOOR: a “mop” or a rough cloth;

- ON THE WALL: a Scotch-Brite sponge from the non-abrasive side (usually the yellow one);

Leave to act for a 2-3 minutes depending on the amount of dirt;
**Rub strongly on possible grout deposits still present with:**

- **ON THE FLOOR:a brush broom; in case of tiles with relief, micro-relief and/or grip finishing use a brush broom with medium-hard nylon bristles;**
- **ON THE WALL: a Scotch-Brite sponge from the abrasive side, usually the**
  - **green one, for tiles with matt finishing;**
  - **white one, for lapped, polished and glazed finishing on wall applications.**

**In case of tiles with relief, micro-relief and/or grip finishing tiles, use a brush with nylon brushes with medium-hard bristles.**
**Remove the residue with liquid vacuum cleaner on the floor or with dry and clean cloths on the wall.**
**Rinse with hot water even repeatedly until all halos are eliminated.**
**On large surfaces, distribute the diluted acid solution by rubbing with the single-brush equipped with:**

- **green disk, for tiles with matt finishing;**
- **white disk, for tiles with lapped and/or polished finishing;**
- **nylon brushes for tiles with relief, micro-relief and/or grip finishing;**

**removing the residue with a liquid vacuum cleaner.**
**At the end, rinse with water only, possibly hot.**

Should some areas of the floor remain dirty, repeat the acid washing with a higher concentration, except when there decorations in ceramic or combined inserts in materials very easy to corrode (ex. marble, metal, ...):

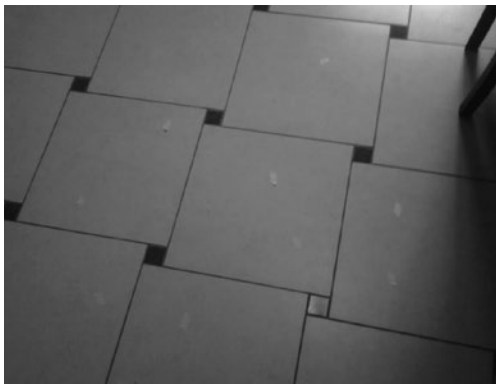


*Figure 23. Corrosion of an insert*

that should anyway have been previously protected with adhesive tape.

## 2.1.2. Method for cleaning residues of epoxy grouts (Class RG – EN 13888)

In case of epoxy grouts, to remove surface stains and halos use **detergents specific for this type of organic residues**, such as **FILA CR10**, following the indications by the manufacturer and strictly complying with the instructions below.


APPROXIMATE QUANTITY OF FILA CR10:

| TILES WITH ANY TYPE OF FINISHING |
|---|
| 3 litres of acid solution every 100 $m^2$ |

Sweep away from the floor any type of deposit or remove the possible dusty film from the wall surface with a dry and clean cloth.
Distribute evenly the **detergent for organic residues**, such as pure **FILA CR10**, with:

- ON THE FLOOR: a “mop” or a rough cloth;
- ON THE WALL: a Scotch-Brite sponge from the non-abrasive side (usually the yellow one);

Leave to act for a 20-30 minutes depending on the amount of dirt.
Rub strongly:

- ON THE FLOOR: a brush broom;
- ON THE WALL: a Scotch-Brite sponge from the abrasive side, (usually green for tiles with matt finishing, or white for lapped and/or polished or glazed finishing in wall applications).

In case of tiles with relief, micro-relief and/or grip finishing tiles, use a brush with nylon brushes with medium-hard bristles.
Remove the residue with liquid vacuum cleaner on the floor or with dry and clean cloths on the wall.
Rinse with hot water even repeatedly until all halos are eliminated.
Should some areas of the floor remain dirty, repeat the washing.
On large surfaces, distribute the product by rubbing with the single-brush equipped with:

- green disk, for tiles with matt finishing;
- white disk, for tiles with lapped and/or polished finishing;
- nylon brushes for tiles with relief, micro-relief and/or grip finishing;

removing the residue with a liquid vacuum cleaner.
**At the end, rinse with water only, possibly hot.**

## 2.2 ORDINARY MAINTENANCE

| TOOLS NEEDED FOR TILES WITH MATT, LAPPED AND/OR POLISHED FINISHING | |
|---|---|
| FOR CLEANING MANUALLY | FOR CLEANING LARGE SURFACES |
| broom, buckets, brush broom, rag, microfibre cloth | washer-drying machine with red disk or brushes with soft nylon bristles |

| TOOLS NEEDED FOR TILES WITH RELIEF, MICRO-RELIEF AND/OR GRIP FINISHING | |
|---|---|
| FOR CLEANING MANUALLY | FOR CLEANING LARGE SURFACES |
| broom, buckets, brush broom | washer-drying machine with soft nylon bristles |

| TOOLS NEEDED FOR TILES WITH GLAZED FINISHING IN WALL APPLICATIONS | |
|---|---|
| FOR CLEANING MANUALLY | FOR CLEANING LARGE SURFACES |
| buckets, rag, microfibre cloth, sponge | |

If the cleaning instructions after the installation have been followed, the ordinary maintenance, namely the daily cleaning for removing the dirt due to the passage and general use of the tiled surfaces, does not cause any problem.
A CORRECT CLEANING consists simply in using a cloth or a wet sponge or a microfibre cloth in a diluted solution of a standard neutral detergent for tiles, such as FILA CLEANER, following the manufacturer instructions.

CAUTION:
Evitare tassativamente l'utilizzo di:
Absolutely avoid to use:

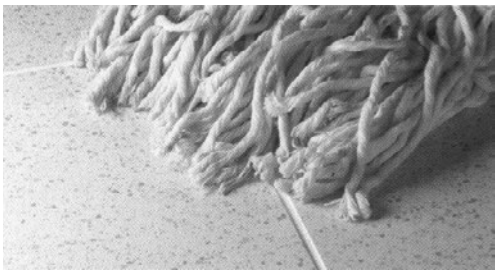
- Products with waxing, intensifying, polishing and brightening characteristics;
- Products containing hydrofluoric acid and its derivatives;
- Metal pads (iron and steel sponges) or excessively abrasive pads.


QUANTITY AND APPROXIMATE DILUTION PERCENTAGE OF FILA CLEANER:

| PRESENCE OF INSERTS AND/OR DECORATIONS IN NATURAL MARBLE OR METAL | TILES WITH MATT/LAPPED/POLISHED FINISHING |
|---|---|
| ½ coffee cup every 5 litres of water | |

Atlas Concorde recommends:
1) ORDINARILY to:

- Remove dust carefully using suitable brooms, woollen clothes and/or a vacuum-cleaner;
- Wash with a neutral low residue detergent, such as FILA CLEANER, diluted 1:200 (approximately ½ coffee cup in a bucket with 5 litres of water) using a wet cloth or a microfibre cloth which must be frequently rinsed in the solution and well squeezed;



CAUTION:
If, after any kind of washing, the floor shows residual marks, wash the floor rinsing frequently and with an abundance of water.

Never use excessive amounts of detergent unless the floor is particularly dirty and correct rinsing of the floor must be carried out during cleaning.


For the use on vertical wall tiling, it is recommended to use a ready-for-use spray neutral detergent, such as FILA BRIO, following carefully the use instructions and the dilutions indicated on the manufacturer package, avoiding to use acid detergents if ceramic decorations or inserts in marble or metal are included.

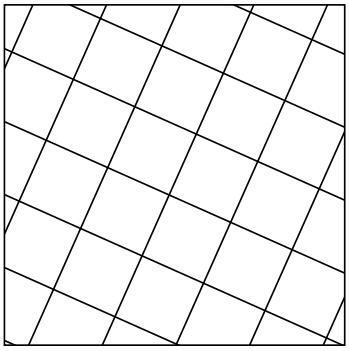
2) PERIODICALLY to:
Carry out a degreasing washing with an alkaline-based detergent, such as FILA PS/87, approximately diluted in water in a 1:20 ratio (if possible in hot water for a greater effectiveness), using a brush broom with rough cloth or a microfibre cloth, then rinse accurately; where a descaling washing is more effective, use an acid-based detergent (except in case of decorations in marble, metal, precious materials), such as FILA DETERDEK, approximately diluted in water in a 1:10 ratio (if possible in hot water for a greater effectiveness), using a brush broom with rough cloth or a microfibre cloth, then rinse accurately.



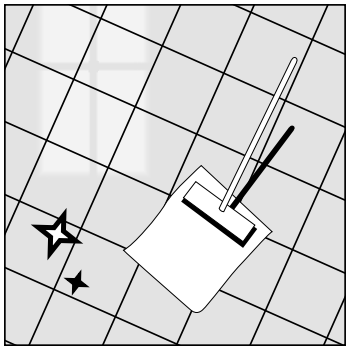
CAUTION:
Should some areas of the floor remain dirty, repeat the descaling washing with a higher concentration of cleaner.
The operator in charge of this maintenance procedure must always make a preliminary test on a small area of the surface in advance.

This “periodical” maintenance must be carried out every time a “film” - generally glossier - forms on the floor due to the use of standard detergents for the ordinary maintenance containing waxes or additives responsible for the formation of many dull areas caused by standard food or drinks (such as wine, coke, vinegar, oil...) or by organic substances (such as urine or vomit...) that can remove the film creating dull areas that look like dirty usually.

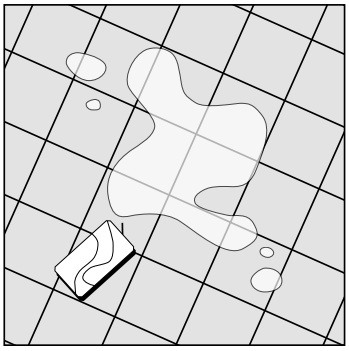
**They are indeed the only clean areas of the floor, as they are the only ones where the tile surface shows the original dullness.**



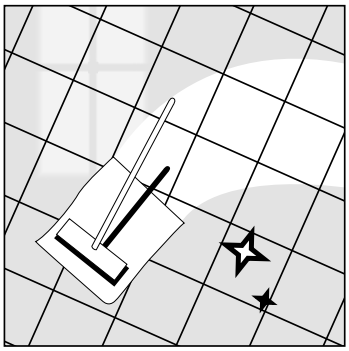
*Pavimento originale*



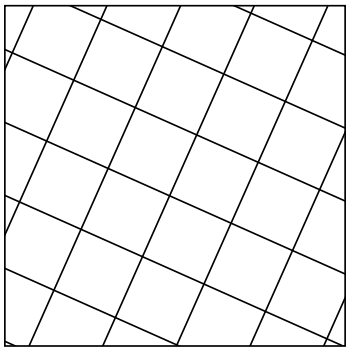
*Patina lucida risultante dall'uso di detergenti contenenti cere o additivi*



*Zone opache in realtà pulite, che emergono con la caduta di alimenti e bevande*

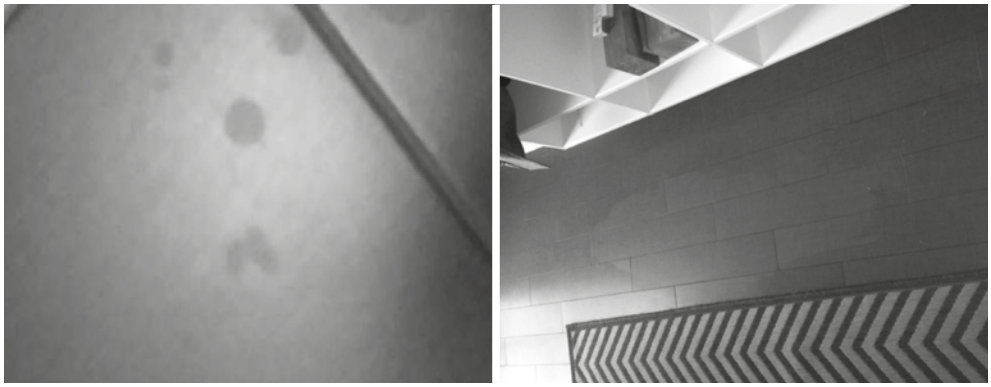


*Lavaggio sgrassante con detergente alcalino*



*Pavimento pulito*

**Indeed, this occurs mainly with satiny/dull MATT finishing:**



For **large surface it is** recommended to use washer-drying machines or single brushes with red disk or brushes with soft nylon bristles and liquid vacuum cleaner using a neutral detergent, such as **FILA CLEANER, approximately diluted in a 1:200 ratio.**

## 2.3 EXTRAORDINARY MAINTENANCE

Extraordinary maintenance is a procedure to be carried out only in the case of particularly resistant stains and rims that cannot be removed with ordinary cleaning procedures.
The removal of these resistant stains occurs via a chemical reaction between the stain itself and the detergent; depending on the type of dirt various different solutions can be adopted as shown in the following chart.
These procedures must be carried out using a wet sponge or a cloth depending on the size and area covered by the stain, after this treatment the floor must be washed with an abundance of water and then dried.

| STAIN TYPE | SOLUTION TYPE |
|---|---|
| OIL AND GREASE | ALKALINE-BASED such as FILA PS/87 |
| BEER | |
| CHEWING GUM | |
| VINYL GLUE | |
| TYRE RUBBER | |
| INK | ALKALINE-BASED such as FILA PS/87 FILA SR/95 |
| NICOTINE | |
| URINE AND VOMIT | |
| FELT PEN | |
| HAIR DYE | |
| COFFEE | |
| WINE | |
| BLOOD | |
| COKE | |
| PAINTS | ALCALINA tipo FILA PS/87 - FILA CR10 |
| SUCKER MARKS | |
| VARNISH | |
| RUST | ACID-BASED such as FILA DETERDEK |
| CEMENT-SALTPETRE | |
| SCALE | |
| ALUMINIUM/METAL MARKS | |
| PENCIL | |
| ENGOBE | |
| EPOXY GROUT | ALKALINE-BASED such as FILA CR10 |
| GRAFFITI | PAINT STRIPPER such as NOPAINT STAR |
| DIRTY JOINT | ALKALINE-BASED such as FUGANET |
| BITUMEN | SOLVENT such as FILASOLV or FILA ZEROSIL |
| CANDLE WAX | |

**WARNING:**
1. The recommendations above are the result of research, laboratory tests and multi-annual expertise.
Anyway, the cleanability characteristics of the material vary significantly for the various installation methods, use conditions and surface types.
Generally, an increase of the antislip performance of tiles correspond to an increase in the maintenance, as unavoidably the surface will get more dirty; nevertheless, this does not mean that it cannot be perfectly cleaned.

2. The professional operator charged with the maintenance and cleaning must always make a previous empirical test (possibly on a section of material not installed, or installed but suitably hidden) for each single type of cleaning procedure above.

3. It is understood that atlas concorde shall not be held responsible for events, damage or defects due to a negligent cleaning and maintenance and in case of very heavy use conditions; Atlas Concorde rejects all responsibilities for the effectiveness of the cleaning and maintenance operations above.

## 2.4 PROTECTION AGAINST ABRASIVE DIRT

Some types of dirt, such as sand, increase the abrasive effect of foot traffic and therefore the flooring must be kept as clean as possible avoiding the presence of this dirt, generally coming from outdoors, by arranging means that can absorb humidity and dirt (fixed mats or furniture depending on the final use of the premise) at the entrance for the entire width.

## 2.5 DEMOLITION OF CERAMIC TILING

Debris from the demolition of the tiling are ceramic tile scraps, therefore “inert” materials (not reactive, chemically and physically stable, resistant to a prolonged exposure even in extreme conditions from a thermal, hygrometric and chemical point of view) that can be located in the environment with no special risk, and can even be used to prepare substrates, etc.

# 3 FAULTS CLASSIFICATION

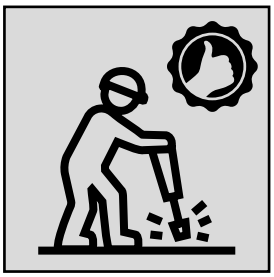
## 3.1 IDENTIFIABLE FAULTS

| Type of fault | Description | Exceptions |
|---|---|---|
| DIMENSION | Tiles with different dimensions (width/ length) inside the same lot (caliber) and with deviations higher than the tolerance values specified in the technical sheet. | / |
| SURFACE FLATNESS | Concave or convex tiles (edge curve) with raised or lowered angles (warping) and with deviations higher than the tolerance values specified in the technical sheet. | / |
| STRAIGHTNESS OF SIDES/ RECTANGULARITY | Tiles with sides that are not rectilinear and not orthogonal ("wedging") and with deviations higher than the tolerance values specified in the technical sheet. | / |
| THICKNESS | Tiles with different thickness inside the same box and with deviations higher than the tolerance values specified in the technical sheet. | / |
| CRACKS | Tile with parallel or orthogonal cracks on the edge or with surface cracks with immediate detachment of the surface plates after beating. | / |
| CHIPPINGS OR ROUGH EDGES | Tiles with broken angles and/or edges inside the boxes. | / |
| SURFACE | Tile with holes, pinholes, depressions, cone-shaped holes, hollows, contamination of body and presence of the brand (stamped on the back side of the ceramic material) on the front surface. | Marks of suckers visible only for a few seconds in humid conditions is not considered as a tile defect, as it is not detected in standard operating conditions. |
| DECORATION | Tiles with defects due to silk-screen printing, glaze, drops, lines of the digital print, .... | / |
| NON-COMPLIANT SHADE | Tiles with shade too different from the reference and/or sample supplied to the customer. | / |
| MIXED SHADES | Tiles in the same lot with a deshading degree higher than the V-Shade specified in the catalogue. | / |
| POLISHING | Tiles with excessive “pinholes”, “peeling” (rising body colour), scratched and/or matt edges, semi-circular surface scratches… | / |
| PROBLEMS DERIVING FROM THE CUTTING PROCESS AND/ OR FROM CHIPS | Tiles that chip, flake, break during the rectilinear cut and/or quadrangular and/or circular drilling. | / |

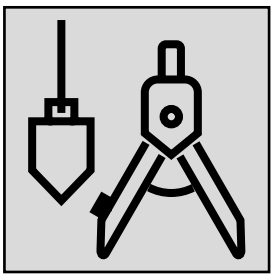
## 3.2 HIDDEN FAULTS

| Type of fault | Description | Exceptions |
|---|---|---|
| CRACKS AND BLISTER | Tiles that show parallel or orthogonal cracks on the edge or surface cracks ("exfoliation") after the installation. | Be careful, as damage to the tiles cut for the perimeter of the floor is mainly due to the inaccurate cut and/or installation of the ceramic. |
| LATER CRAZING | Glazed wall tiles that show “late” crazing a few months after the installation. | This defect can be due to ceramic, but most of the times to a “non-perfect” installation. |
| FROST DAMAGE | Tiles that show cracks or flakes quite typical of ceramic, most of the time of the hollow type, a few month after the installation outdoors. | The detachment and/or rising of the tiles installed outdoors, as well the breakage of single and/or reciprocally adjacent tiles, are not due to the ceramic, rather to a wrong installation. |
| STAINING | Tiles which abnormally keep dirt and are difficult to clean. | It is most likely a hidden defect, but it must be checked if it is due to a faulty performance of the installed ceramic material and/or to wrong maintenance by the final customer. |

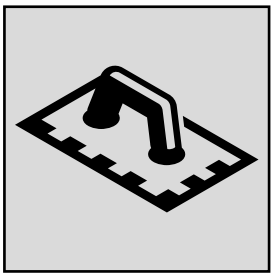
## 4 KEYS



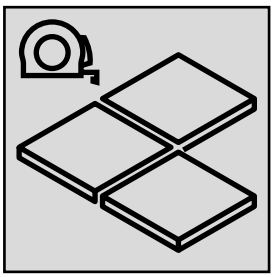
1. Compliance with a perfect installation



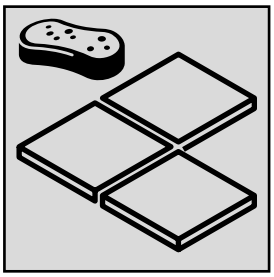
2. Flatness of the finished trampling surface



3. Correct use of the backbuttering technique



4. Respect the joint dimensions



5. Carry out the site completion cleaning

6. Finish with an ordinary cleaning

CERAMICHE ATLAS CONCORDE S.p.A.
Via Canaletto 141
41042 Spezzano di Fiorano (MO) – Italia
*info@atlasconcorde.it*
*www.atlasconcorde.it*

ATLAS CONCORDE USA, INC.
117 Seaboard Lane - Suite 170
Franklin, TN 37067 - USA

ATLAS CONCORDE RUSSIA
Business centre “Meliora Place”
Prospekt Mira 6, 129090 Mosca – Russia
*info@atlasconcorderussia.ru*

atlas concorde