

INSTRUCTION MANUAL OF INSTALLATION OF CERAMIKA PARADYŻ PRODUCTS

Before the installation of Ceramika Paradyż products, please familiarize yourself with their parameters and intended purpose as specified by the manufacturer in the Declaration of Performance and the Product's Technical Sheet available at www.paradyz.com/deklaracje, <https://deklaracje.paradyz.com.pl/>.

Ceramika Paradyż products satisfy the criteria specified in EN 14411:2012 (*Ceramic tiles. Definitions, classification, characteristics, evaluation of conformity and marking*) and the *European Technical Assessment* ETA-19/0861 of December 30, 2019.

Products

Decorations – ceramic and glass strips, shaped profiles and inserts with ornaments.: metallized surfaces, mirror coat, metal elements and steel decorations.

Monoporosa – a group of wall tiles with water absorption $E_b > 10\%$, for indoor use, in rooms with temperature over 0°C . Due to the applied enamel, they cannot be installed on floors.

Monocottura – glazed tiles with water absorption ranging from $0.5\% < E_b$ to $E_b \leq 3\%$. The tiles produced using this technology are designed for installation on walls and floors, both indoors and outdoors. Their specific purpose depends on the abrasion resistance parameter, *PEI*.

Clinker - clinker products with water absorption from $0.5\% < E_b$ to $\leq 3\%$ are manufactured in glazed and unglazed varieties. Clinker tiles can be applied to walls and floors, both indoors and outdoors.

Porcelain stoneware (gres) - ceramic tiles with water absorption $E_b < 0.5\%$, the hardest type of ceramic materials. They are frost-proof due to low water absorption. Porcelain stoneware tiles are manufactured in glazed and unglazed varieties, for installation on walls and floors.

→ **Glazed porcelain (GL)** - comes in a variety of surface types: matt, glossy, semi-polished and polished, in an endless assortment of designs. The particular application of tiles depends on the type of surface and the glaze's abrasion resistance, *PEI*. For indoors and outdoors use alike.

→ **Unglazed porcelain (UGL)** – matt tiles, polished and structural, with bright or dyed body. Manufactured in single batch technology, the tiles are offered in single colours (*monocolour*) and in granulated patterns (*salt & pepper*). In case of tiles manufactured in dual batch technology, the top, decorative layer is a mix of dye granulates, producing unique patterns with colour gradients. For indoor and outdoor application.

The most important utility parameters

PEI - a parameter that determines glazed tiles resistance to abrasion The parameter is expressed with two numbers. The first number determines the abrasion class and the second one the number of

revolutions of a cylinder (with adequately selected abrasive material), after which glaze shows visible signs of wear. Classification of abrasion resistance of glazed ceramic tiles (number of revolutions in brackets): Class 0 (100); Class 1 (150); Class 2 (600); Class 3 (750, 1,500); Class 4 (2,100, 6,000, 12,000); Class 5 (Over 12,000).

Slippage – a parameter that can be determined with two methods:

→ **Walking test - The ramp**

Slippage is determined on the basis of the achieved, acceptable angle - the angle of inclination of the examined surface, at which the examiner achieves the limit of safe walking. The symbol R9 through R13 is used for determining anti-slip properties of tiles - the higher the R parameter, the less slippery the tile is. Tiles whose acceptable angle is below 6°, are not classified as anti-slip.

Average value of acceptable angle [°]	Anti-slip class
6 - 10	R 9 - (lowest resistance)
10 -19	R 10 - (normal resistance)
19 -27	R 11 - (good resistance)
27- 35	R 12 - (high resistance)
> 35	R 13 - (very high resistance)

→ **The pendulum method**

Slip resistance (Pendulum Test Value - PTV) is determined with a pendulum test. A calibrated scale is used to determine the friction between a slider, mounted to a pendulum, and the surface of the examined sample, by measuring the tilt of the pendulum. The test is done on a dry and wet surface. PTV slip risk classification: high 0-24, moderate 25-35, low 36+.

Calibre - the tiles are grouped into specific dimension ranges, the so-called calibres, within tolerances specified in the standard. This parameter only applies to non-rectified floor tiles. Each package carries the calibre designation and relevant dimension ranges.

Rectification - a process of mechanical grinding of the tile's edge, to a straight angle in relation to its surface. Thanks to this, all tiles have uniform dimensions. The process of rectification can be applied both to wall tiles and floor tiles.

Hue - the intensity of colours of glazed tiles (print – background) in relation to the used pattern. In case of unglazed tiles, the difference results from the intensity of colour of granulates used in tiles.

Tonality – different patterns, graphics and colours of tiles. The variety of ornaments that imitate the appearance of, for example, stone, wood or concrete, means that when placed as a set, tiles with tonal characteristics do not create a fluent transition of graphic elements.

After purchasing tiles

The transport

When transporting ceramic tiles make sure to place pallets very close to each other. Secure any void spaces to prevent the load from shifting. Ceramic tiles should be always transported vertically, placing the packaging on its longer side (except for mosaic tiles, recommended to be transported in a horizontal position). Due to their fragility, glass products and decorations with glass elements, should

be transported with extreme care. Any packaging with products weighing over 25 kg should be carried by two people or using specialized transport equipment.

Warehousing (storage)

Pallets should be placed on even, paved and dry ground. Tiles should be protected against humidity and non frost-proof products should be protected against temperatures $T \leq 0^{\circ}\text{C}$. The information about permissible stacking of pallets with finished goods is located on the pallet label.

Prior to installation

Always start by carefully examining the labels on tile packaging and the quality of ceramics. The calibre and hue of tiles to be installed on a single surface should be the same. When placing products with tonal characteristics, it is recommended to mix tiles from different packaging, because the differences in graphics and colours are intentional. In case more products are to be ordered later, the products labels / packaging should be kept for easier identification.

Observe good construction practices and follow recommendations listed in construction handbooks and professional literature.

Substrate preparation

The first step in preparing the substrate for laying tiles is to carefully clean it. Remove all dirt, paint residue, dust and any other peeling layers. The substrate must be stable, solid and even. Make sure it is vertical / horizontal and verify its humidity. If there are any uneven spots on the surface, they should be levelled out with levelling / self-levelling compound.

Priming the surface is one of the last stages of preparing it for the installation of ceramics. The application of a correct primer improves the substrate's adhesion, levels it out and reduces its water absorption properties.

Remember to make expansion joints in the substrate.

If the substrate is prepared improperly, ceramic tiles may later detach and crack.

Planning the layout

The process of application should be started by planning the layout, determining the axis of application, taking into consideration the expansion joints and placing the tiles on the floor as a trial, with no adhesive.

The available formats and variety of graphics within a single collection of tiles allows to achieve very interesting designs.

Ceramic tiles have tolerance with regard to surface evenness, easiest to spot with long and narrow products. To even out any possible variations that may show during installation, the maximal offset of such tiles should be $1/3$ of the length of the adjacent tile. This produces a similar effect to floor boards or panels, while maintaining flat and even surface of the floor.

Additionally, levelling systems are recommended for use on uneven substrates. Please note that the minimal gap for rectified tiles is 1.5 mm and 3.0 mm for non-rectified tiles.

Expansion joints in the floor

Expansion joints should be used where the highest stress areas are, on boundaries of materials with various material structure parameters (pillars, walls, etc.). They allow natural movement of individual materials and eliminate stresses caused by the natural expansion and contraction of various materials used in the entire cladding. To prevent elements from shifting, expansion joints should be filled with permanently flexible materials. As far as possible, expansion joints should be placed around surfaces resembling a square (max. side proportions 1:2), along the surface's edges, so as to isolate the floor from the walls. All existing expansion joints in the substrate should be transferred to the layer of tiles. The maximal surface with no expansion joints is 25 m², and if there is floor heating, 16 m².

Floor heating

A complete procedure of initial heating of the screed should be done before starting any tile work. The materials used for preparing substrates with floor heating should be used according to the manufacturer's recommendations (thickness, binding time, etc.) and all tile work should only be done when floor heating is off.

When installing tiles on floors with floor heating, make sure to use surface expansion joints to isolate the individual heating loops.

Having in mind temperature differences, the floor should be divided, if possible, into 9 – 16 m² areas.

Cutting the tiles

Cutting tiles and decorative elements (pre-cutting, splitting, grinding, making holes) is not a difficult process, if adequate tools are used by skilled professionals. Tiles should be cut with dedicated equipment, e.g. a tile breaker / cutter, a handheld grinder with a correct cutting disc. To obtain evenly shaped edges, use diamond saws or other tools using equivalent technology. Holes should be made either with diamond drills or adequately selected hole saws.

It is important to take into account the wear of the tool and the type of processed material. Regular and irregular shapes may be also cut using WATERJET tools (high-pressure water jet with abrasive material).

Gluings the tiles

Collect the laid out tiles and proceed to install them. The selection of adhesive depends on the place of installation (e.g. a wet area, indoors / outdoors) and the type of substrate (e.g. concrete, gypsum). The size and type of tiles (water absorption class) determine the choice of adhesive with specific adhesive properties. The adhesive's technical sheet should specify whether it is suitable for specific use, e.g. for floor heating. The adhesive should be prepared following the manufacturer's instructions, paying particular attention to the amount of water and application time, during which the adhesive maintains correct adhesion and binding time.

The tiles should be always laid with gaps, because the edge-to-edge method creates a surface that is very sensitive to any stress. The main purpose of expansion joints is to balance any stresses that may result from temperature variations or deformations (shifting) of the substrate. The adhesive should be applied onto the prepared substrate and its thickness should conform to the manufacturer's recommendations. The adhesive should be applied with a tiling trowel with notch size selected specifically to the size of tiles. A tile should be placed to the applied adhesive and gently slid across

the substrate to ensure adequate adhesion. Use of the combined method, where the adhesive is applied both to the tile and the surface, removes any air pockets under the ceramics.

The ceramic cladding should form a permanent connection with the substrate (no hollow sounds should be heard when gently knocking a tile). While doing tile work, follow the recommendations of manufacturers of any construction chemical agents used.

Grouting tiles and decorative elements

Grouting tiles and decorative elements should be only done after making sure they have completely bonded with the substrate (in time specified by the adhesive manufacturer), taking into account the time needed for the batched water to evaporate from the material used for installation. If the grout is applied too early, the trapped humidity may result in discolouration. Before proceeding to grout the entire cladding, it is absolutely necessary to do a trial grout on a small fragment of a tile and do a trial cleaning to assess how the grout affects the tile. If there are any difficulties in removing the grout, change it and impregnate the surface of tiles. Coarse grout should not be used with decorative elements. The ornaments on decorative elements are easily scratched, so it is recommended to use acrylic, silicone or other non-scratching grout. The surface of decorative elements should be protected for the duration of grouting, e.g. with masking tape. To ensure the ceramic cladding achieves proper visual appearance, grouting must be done according to the manufacturer's instructions. It is particularly important to use the correct amount of batched water, observe the binding time and the time after which the remains of grouting should be removed. The prepared mass should be applied with a rubber trowel, onto a clean surface. Tiles should be grouted in sections, by pressing the material in the gaps with a grouting trowel, until they are completely and uniformly filled. Permanently flexible materials, e.g. silicone, must be used where horizontal and vertical surfaces meet and where tiles are adjacent to any sanitary equipment or door frames. To protect tiles from getting dirty, their edges can be covered with masking tape, to be removed before grouting cures completely. Grouted surface should be cleaned according to the recommendations of the manufacturer of the applied grout. Excess grout should be gently removed from the tile's face surface, making sure not to wash out any fresh grout or scratch the tile.

After completing the installation

A key element of the installation procedure is to thoroughly clean the surface afterwards. It is recommended to clean tiles with commercially available cleaning agents, according to their intended purpose (cement residues - with acidic agents, synthetic residues - alkaline agents). When using any cleaning agents, follow the manufacturer's recommendations and first do a trial on a small fragment of the cleaned surface. Every product's chemical resistance is specified in the *Product's Technical Sheet*.

After the installation works and cleaning the floor, protect the surface before further works. This is to protect the floor from scratches and spills. The applied protection material should closely adhere to the floor, be impossible to shift and prevent penetration of dirt.

Daily maintenance

Alcaic cleaning agents should be used for removing dirt on a daily basis, but to remove water scale caused by evaporation, it is recommended to use acidic agents (periodic maintenance).

When washing or cleaning any surfaces, it is important to combine three factors: cleaning agent activity, mechanical activity and time. The initial stage, consisting in dissolving impurities, aims to

separate them from the ceramic surface and is critical for the success of cleaning. The maintenance of tiles with better anti-slip properties requires more effort when cleaning them.

The selection of cleaning agents should be consulted with manufacturers and distributors of chemical agents used for cleaning ceramic surfaces. Please note that agents with glazing compounds must not be used for cleaning such tiles. Follow the manufacturer's recommendations when dosing any cleaning agents.

Glass products and products incorporating metal or stainless steel elements should be cleaned and maintained using gentle surface-active detergents that cause no damage (e.g. scratches) or deterioration of the decorative element's utility properties.

The manufacturer waives any responsibility for damage to tiles and decorative resulting from the use of improper agents.

IMPREGNATION

Applied to the tile's surface, an impregnate creates a thin layer on it, lending to the tile its own parameters and is ultimately responsible for its appearance. If you wish to apply an impregnate on the tiles, we recommend first doing a trial. Since glazed tiles are manufactured in a way allowing their use with no additional protective layers, it is not recommended to use impregnate on them.

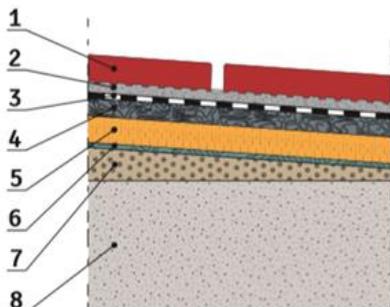
Outdoor installation

The surface of the substrate on which tiles are to be installed must be stable, even, free from any cracks, thoroughly cleaned and resistant to deformation. A primer should be applied to reduce the surface's absorptive properties. For tiles installed on balconies and terraces, it is necessary to make substrate and insulating layers, as well as expansion joints. Any inclinations should be done in the substrate layer. During installation, make sure that tiles fully adhere to the substrate, with no air pockets, in which water may accumulate, leading to detrimental effects in case of frost. Only materials for the installation of frost-proof tiles may be used.

The following diagrams show examples of making cladding and terraces.

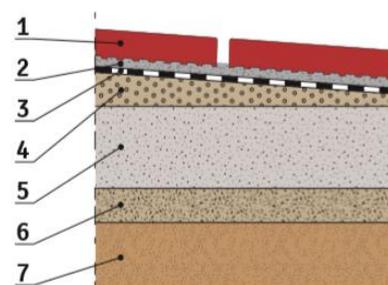
Terrace over a heated room.

1. Ceramic tiles cladding
2. Flexible adhesive
3. Anti-moisture sub-tile insulation
4. Pressure layer made from concrete
5. Thermal insulation
6. Waterproof insulation
7. Inclination layer (min. 1.5%)
8. Load-bearing structural slab



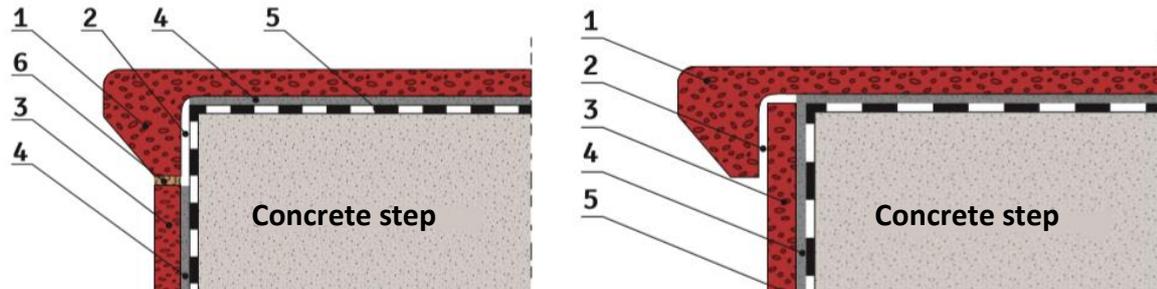
Terrace on ground

1. Ceramic tiles cladding
2. Flexible adhesive
3. Anti-moisture sub-tile insulation
4. Inclination layer (min. 1.5%)
5. Load-bearing structural slab
6. Levelling sand ballast
7. Breakstone filtering layer



Installation of step tiles with drips

1. Step tile
2. Gap 3-5 mm
3. Step riser tile
4. Flexible adhesive
5. Anti-moisture sub-tile insulation
6. Permanently flexible material



When installing step tiles with drips, leave a gap (3-5 mm), with no adhesive or grout.

- In case of larger areas, it is necessary to make expansion joints, as per the recommendations of construction chemical materials manufacturers.
- The expansion joint's width should be at least 10 mm.
- The recommended grout width is 6-10 mm.

Handling waste

Tiles and ceramic decorative elements are safe for the environment. The waste of such products, generated during construction and repair works or from the removal of tiles and decorative elements can be reclaimed and used e.g. for paving (improving) ground. According to the current waste removal regulations they may also be collected with municipal waste.

Product packaging should be segregated for reclamation and recycling, according to waste category:

- paper and cardboard packaging,
- plastic packaging (foil, strips),
- styrofoam packaging,
- wooden packaging.

Safety principles

The products are classified as safe under normal conditions and have no impact on health and environment. However, the dust generated during cutting, grinding or other mechanical processing may cause irritation. Consequently, it is recommended to only use wet processing methods.

If there is a risk that dust may be inhaled, it is recommended to use mechanical exhaust ventilation. Personal protective equipment should be used (protective glasses, gloves, dust mask).

Please read all information in the leaflets dedicated for specific product groups.