KODERUS
Concrete Solutions

NOTE FROM THE MANUFACTURER ON THE APPEARANCE CHARACTERISTICS OF THE CONCRETE SURFACE

UAB KODERUS produces dense concrete with a density of 1,800–2,500 kg/m³, corresponding to strength class C35/45. The products used are conventional Portland cement and pigments, which, when in contact with the mould surface, create mineral-based products.

A specific knowledge, skills and/or tools are required for the selection and installation of KODERUS concrete products in the building envelope. In order for the concrete products to perform as we, the manufacturer, have declared and to be suitable for their intended use throughout the warranty period, it is necessary to comply with the requirements set out in the Installation Instructions – Product Technological Card. These requirements apply to the installation and operation of the concrete products (special requirements have been foreseen for products purchased by the Purchaser). If the products are not installed or operated correctly, they will lose their durability and may start to crumble, split or discolour, and will not meet their declared properties. Failure to comply with these requirements and damage to the product will result in the product not being covered by warranty.

Here are the most common errors people make when installing or using our products:

1. The product is installed in temperatures below +5 degrees Celsius on damp substrates, which may affect the aesthetics of the product (carbonate deposits on the surface of the product).
2. The product has not been adequately secured to the building's surface, resulting in the formation of cold bridges. These bridges serve as pathways for moisture to permeate, which may potentially lead to the product detaching or splintering over time.
3. In the event of the product becoming soiled, the user may attempt to clean it with a chemistry not suited to mineral surfaces. This may result in discolouration or the formation of pores on the surface of the product.

IT IS IMPERATIVE TO NOTE THAT TOLERANCES OF THE FAÇADE PANEL SHALL NOT BE REGARDED AS DEFECTS

Changes in the surface texture and structure of the product may also be influenced by factors occurring during the product's lifecycle. These factors do not affect the product's durability and are not considered to be a non-conformity. Due to the inherent characteristics of natural materials utilised in the fabrication of the product, a certain degree of imperfection in terms of evenness and uniformity is to be expected. Such variations are inherent to the nature of the materials and are therefore to be anticipated.

- the presence of scratches on the surface of the product up to a depth of 0,5 mm

- uneven sides/edges of the product

- the presence/appearance of white spots on the surface of products as a result of the release of calcium carbonate (lime). The presence of these stains is indicative of the product being made with Portland cement, which naturally releases lime

- localised damage to the surface of products (dents)
- pits (pores) in the surface of products which are formed during the manufacture of products
- There may be a difference in colour between the product and the colour of the product shown on the website or in the information publications. Please note that there may also be differences in the shades of the individual panels.
- The visual characteristics (differences in colour, texture and appearance) of the products when compared with each other are influenced by a number of factors. These include the natural fillers used in the manufacturing process, variations in their shades, the curing conditions and the properties of the other raw materials used.
- localised surface damage (rust spots) not caused by the manufacturer (see information below)

All gravel deposits in Lithuania, from which aggregates are extracted for use in concrete products, contain reactive rocks and may contain trace elements not visible to the naked eye.

It should be noted that according to the legislation of the Republic of Lithuania, the effect of the constituent parts of concrete products (aggregates) on the appearance of the surface of the products is possible and permissible. As outlined above, localised surface defects on concrete products are not considered defects.

1. Carbonate deposits on the surface of products.

Carbonate deposits (alkalis) are white deposits of calcium carbonate formed on the surface of concrete products by reacting with carbon dioxide and calcium bicarbonate dissolved in water; they are water-soluble and are an unavoidable chemical process common to mineral surfaces. Rainwater will also gradually remove the salts on the surface of the product, ensuring that it maintains a high level of purity. Carbonisation is an unavoidable process on surfaces that have been impregnated or painted.

Carbonate deposits	The molecular formula CaCO3. The calcium carbonate subsequently reacts with carbon dioxide (CO2) dissolved in water on the surface of the product to form calcium bicarbonate, which is soluble in water. $CaCO3 + CO2 + H2O = Ca(HCO3)2$ The salts released on the surface of the product are washed away by rain after a long time. 

Figure 36. Carbonate deposits on product surfaces

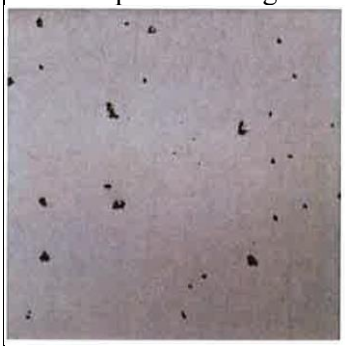
2. Colour variation on product surfaces and product fading.

Each panel is naturally pigmented and as such is unique. Consequently, surface brightness may vary from factory to factory.

Fading of a naturally pigmented product is the unavoidable reaction of dark pigments (containing iron oxides) to UV light. In order to protect the concrete from intense fading, it is necessary to impregnate it with an additional pigment or to apply a specially selected façade paint. Such surfaces preserve the integrity of the colour and protect it from intense fading.

3. Concrete pores

Concrete pores may not cover more than 4 % of the surface of any one product

Characteristics	Description
Dent	During the laying and compaction of the concrete mix, **some** of the air is not displaced, so that when the mix *comes into contact with the surface of the substrate*, depressions are formed, which are visible on the surface of the finished product. Depressions are also formed in the absence of contact with the surface of the mould, e.g. when levelling the horizontal surface of the concrete mix.The number of depressions is limited to an area of 1 m2 of product. The number of depressions on the surface of the product shall not be limited, provided that the diameter and depth of the depression do not exceed 5 mm. There shall be no depressions larger than 10 mm in diameter and deeper than 5 mm.  **Figure 21 Example of a depression**

4. Geometric deviations

Nominal dimensions of the panel (length and width) +l / -3 mm (measured in three places: at the edges and in the middle of the panel; judged on the basis of the arithmetic mean of all measurements).
Panel thickness +/- 3 mm measured in three places: at the edges and in the middle of the panel; assessment based on the arithmetic mean of all measurements).
Perpendicularity +/- 6 mm (difference between the measured diagonal and the judged diagonal). Straightness of edges +/- 3 mm / 1 m (all edges are measured, measurement length 1 m). Flatness +/- 6 mm (measured at the centre of the diagonal)
Thermal insulation (EPS) layer thickness +/- 3 mm (measured at three points on each of the long sides of the panel - at the edges and in the middle of the edge; taken as the arithmetic mean of all dimensions).
Micro-cracks allowed - a maximum of five micro-cracks per article, not exceeding 20 cm in length (micro-cracks < 0,4 mm)

The physical characteristics of the surface of the product shall be determined by touch and close inspection. The surface texture of a product can be seen from a greater distance, where the close-up image blends in and out, creating a certain colour variation. The visual appearance of the surface of the product does not affect the load-bearing capacity and durability of the product.

Tolerances and defects in the façade panels and other elements shall be checked on site. A repeat quality check is required prior to on-site installation work. Where products exceed the tolerances or have been damaged during transport, such products may exceptionally be used only by sawing off the undamaged part.

5. Interaction of EPS neoprene (grey) with mineral (concrete) surfaces

Grey polystyrene foam - non-porous, has better thermal performance than white foam, does not change its properties on contact with moisture and retains its shape, but is afraid of large temperature fluctuations due to heat. The risk of this foam heating up to 80-100 degrees Celsius in direct sunlight and melting must be considered. Grey foam is the most mobile. It heats up and expands in the hot season and shrinks in the cold season. Deformation of the panels with no pores (especially on the south side of the façade) and/or possible micro-cracking of the surface of the flooded concrete are possible, especially if a dark pigment or paint colour is chosen.

APPROVED

UAB

KODERUS

Director
Edvard Racevskij
Stamp here://
Signature