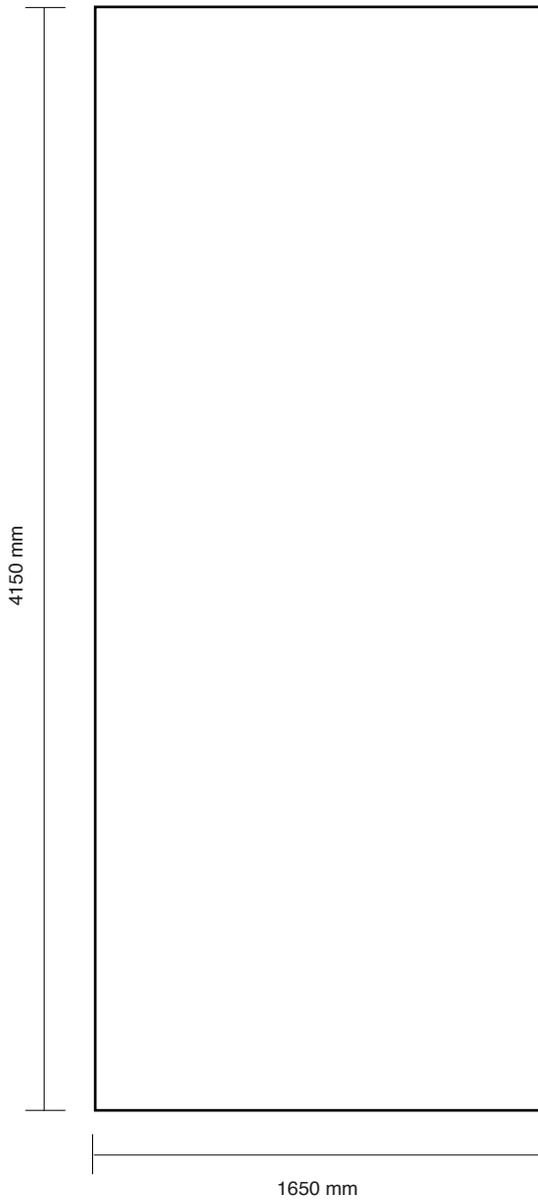


The GammaStone UHPC Plus AIR solution is composed of ultra-thin high-performance concrete reinforced with amorphous metal fibers.



UHPC PLUS AIR

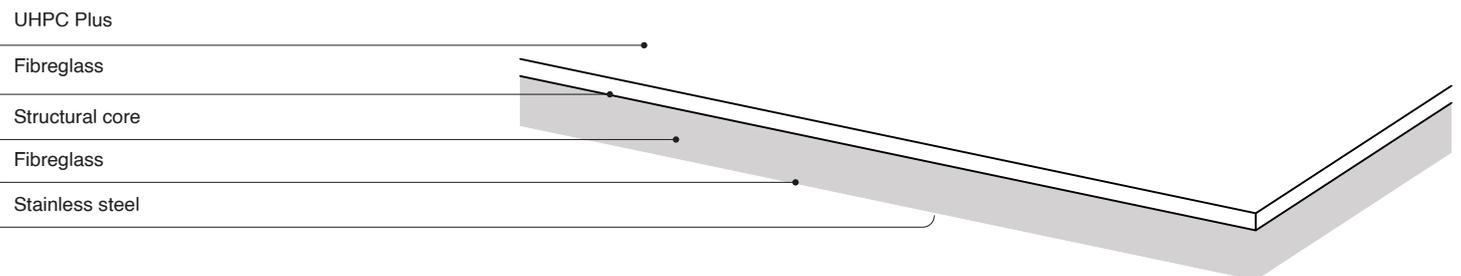
General Data



Max Panel Sizes

4150x1650 mm (6,8 m²)
163.4"x65" (73.8 ft²)

Panel Structure



Characteristics

GammaStone 2021 new product

GammaStone UHPC Plus AIR is an ultra-high performance concrete panel that is lightweight and extremely strong. Architects can design the façade is UHPC Plus to achieve a concrete appearance without intensely stressing the underlying structure – making it a unique solution for high-rise buildings. The UHPC Plus AIR panel consists of a thin ultra-high performance concrete slab and a structural core placed between two glass fiber mats and supported by a 0.5 mm thick stainless steel plate. The total panel thickness is 17mm and the total weight is 18kg/sqm. The maximum size is 4150x1650mm. Made-to-size elements are cut to the correct size with water jets. All GammaStone UHPC Plus AIR panels can be customized in shape, color, and surface finish to suit the designer’s requirements.

What is UHPC?

Ultra-High Performance Concrete (UHPC) is a type of concrete which has very high flexural and compressive strength and is used for heavy-duty applications.

Why choose UHPC for architectural applications?

GammaStone has developed a high-performance cementitious mortar specifically for façade applications. It has been designed for external use and is therefore very flexible and resistant to all types of natural external stress.

Less is more

UHPC is much stronger than classic GFRC and therefore its performance is more comparable to steel than to concrete.

Material Characteristics GammaStone UHPC Plus AIR is the result of extensive research into aggregates and hydraulic binders. It guarantees a high resistance to bending, compression, and impact because the molecules are extremely thin and there are no pores in the mortar.

Freeze/Thaw Performance

Since the molecules are so thin and poreless, unlike traditional concrete, GFRC, or fiber cement, UHPC absorbs much less water. This makes it much more resistant to freezing/thawing conditions because it will not crack or degrade over time. It is also performs well in locations exposed to salt spray.

Environmental Impact

The production of UHPC at GammaStone’s facility respects all environmental standards. Furthermore, since the thickness of the cement is lower, the environmental impact is less since we use less material.

Design Options Comparison: GammaStone UHPC with other GFRC

The quality of GammaStone’s UHPC surface is aesthetically superior to other types of materials, as the colors are more saturated and more resistant to UV rays. Since it is a very thin and fluid compound it follows exactly the surface finish of the panel ensuring an even application and not interfering with its aesthetic appearance.

Strength + Stability Comparison: GammaStone UHPC with other GFRC

In contrast, UHPC panels are up to four times stronger, with stand much higher loads, are much more stable and can withstand thermal expansion.

Colors and Surfaces

Colors and surfaces

GammaStone UHPC Plus AIR offers a range of many different design and options for external and internal facades. Large selection of finishing and colors to meet the individual expectations. Special finishing and colors can be produced on request. It is possible to customize the design with a combination of different colors and textures.

Natural colors

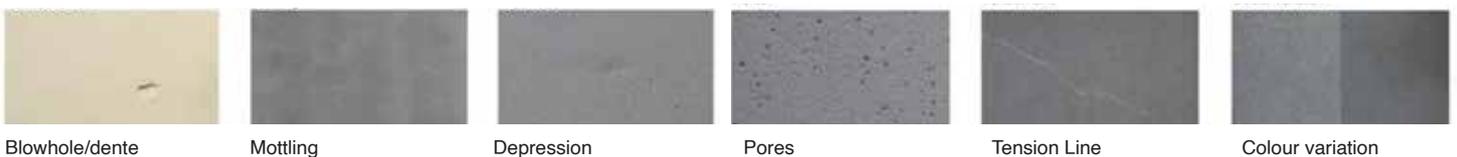
The GammaStone UHPC Plus AIR has a better advantage against other color treated materials. The color mixture has been prepared before the production process and final color will be applied during the mixing process of the raw materials. Other coating processes are applied superficially, applying only a thin layer of color on the external panel surface. The ferric oxide colour applied on GammaStone UHPC gives to the UHPC an authentic and natural finishing, that fits perfectly in nature and blends with landscapes.

Color strength and UV stability

The pigments used in our colors are UV resistant, not soluble in water, alkalis or diluted acids. Our liquid color also comply with the EN 12878. There are factors that must be taken into consideration, like changes on finishing by age, or made by natural process as weather or specific environment process, air moisture, dirt and light sources. These factors could cause alteration on final appearance of our panel, maybe becoming brighter due to dehydration, but it cannot be considered as a product defect. All factors above described will not change the technical characteristics and strength of our panel.

Color differences

The advantage of producing our UHPC internally, is that we can provide multiple colors solutions to our clients. The same colored panel produced in a different production batch might have a slightly different color tone. To avoid this, we suggest to order the full project with extra spare panels, instead of ordering part of the project. The reason is to avoid discrepancies from the original colors shade.



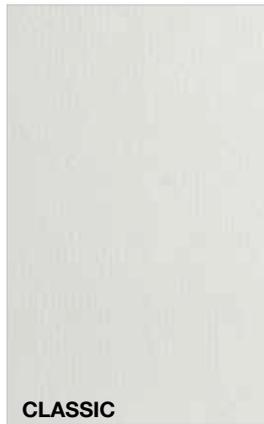
Small air bubbles and porosity are possible: data sheet on exposed concrete 06/2015 (Publ.:BDZ/DBV)

Subject to the particular quotation documentation. The technical description of product characteristics should not be interpreted as a contractual commitment on the part of the manufacturers. Despite careful inspection, no liability can be accepted for the correctness, completeness and topicality of the document. This is particularly true for typographical errors or subsequent changes to technical specifications

Colors



Finishes



CLASSIC



VEINED



BRUSH



NATURAL



RIVER



DOTTED



TEXTILE



LINE



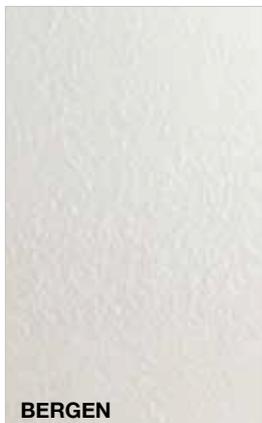
UNIFORM



GRAIN



WOOD



BERGEN

General and Geometrical tolerance

UHPC Plus Air - 5 mm

TECHNICAL DATA	EU	USA	PANEL STRUCTURE
Max panel sizes	4150x1650 mm (6,8 m ²)	163.4"x65" (73.8 ft ²)	
Total Panel Thickness	16 mm	≈ 5/8"	
UHPC Thickness	5 mm	≈ 13/64"	
Panel weight	18 kg/m ²	3.7 lb/sqft	

Dimensional deviations

(sizes in mm)

Up to 1.000	More than 1.000 Up to 2.000	More than 2.000 Up to 4.000
± 1	± 1.5	± 2

Dimensional deviations of monolithic assembled returns

(sizes in mm per each assembled return)

Up to 500	More than 500 Up to 1.000	More than 1.000 Up to 2.000
-1 +2	-1 +2.5	-1.5 +3

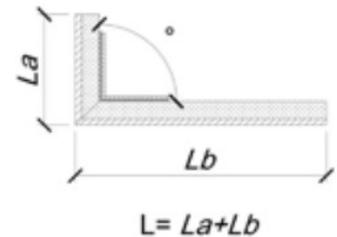
(sizes in mm per double assembled return)

Up to 500	More than 500 Up to 1.000	More than 1.000 Up to 2.000
-1 +3	-1 +3.5	-1.5 +4

Edge tolerances for monolithic assembled returns

Limit deviations refer to the total length in mm of the panels on the sides of the return

L Up to 500	L More than 500 Up to 1.000	L More than 1.000
± 1°	± 0°30'	± 0°20'



Edges for monolithic assembled returns

Dimension of the bevel or radius of the monolithic edge

UHPC Plus	Max 5 mm
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The data shown in this technical data sheet are not binding and can be modified without any kind of notice.

Thickness

The thickness tolerance of the Air Panel is strictly linked to the material used because it is determined by the sum of the UHPC tolerance + the tolerance of the AIR panel laminated to the slab of UHPC.

Maximum Thickness deviation of AIR Panel ± 2,50
(Σ Deviation in mm)

Deviation from the diagonals of the single non assembled panels

Diagonal Dimension D1	Difference with Diagonal D2
Up to 1000 mm	2 mm
Between 1000 and 2000 mm	3 mm
Above 2000 mm	5 mm

ATTENTION: Deviating from the above specifications requires written agreement between both parties

Technical data sheet

FIRE TEST

Test	Description	Result
UNI 9177:2008 UNI 8457:2010 UNI 9174:2010	Reaction to fire	Classe 1
UNI EN 13501-1:2009 UNI EN 13823:2010 UNI EN ISO 11925-2:2005	Fire classification	B - s1, d0
ASTM E 84 (UL 723)	Surface burning characteristics	Class A
ASTM E 136	Behavior of materials at 750°C (1382°F)	Non-combustible
CAN/ULC-S114 ASTM E1530:2006	Test for Non-Combustibility	Non-combustible
ASTM C297/C297M - 16	Standard Test Method for Flatwise Tensile Strength	1,37 ± 0,05 MPa
NFPA 285	Fire test	Passed
BS8414-1	Fire test	Passed

EUROPEAN TESTS

Test	Description	Result
UNI EN ISO 10545-8:2014	Determination of linear thermal expansion	1.6
UNI EN 772-14:2003	Determination of moisture movement	0.04 ÷ 0.13 mm/m
UNI EN ISO 10545-4:2012 UNI EN 12467:2016	Determination of the breaking strength	4.3 ÷ 6.2 N/mm ² 2.9 ÷ 3.9 N/mm ²
UNI EN 12089:2013	Determination of bending behavior	4160 ÷ 5867 kPa
UNI EN 12467:2016	Determination of frost/defrost resistance	No fault

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EUROPEAN TESTS

Test	Description	Result
UNI EN 12467:2016	Determination of water absorption	No water
UNI EN ISO 10545-9:2013	Determination of resistance to thermal shock	No fault
ETAG 034-1:2012	Wind depression load resistance	4610 Pa
MED 2014/90/EU	Determination of calorific value	Passed
MED 2014/90/EU	Determination of the limited ability to propagate the flame	Passed

The tests refer to a GammaStone UHPC Plus AIR panel with 5 mm thick UHPC. The complete list of tests can be found on gammastone.com



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