

AALBORG<sup>®</sup>  
**INBIND**

**BINDER FOR  
ULTRA HIGH-PERFORMANCE  
CONCRETE & MORTAR**

# BINDER FOR ULTRA HIGH-PERFORMANCE CONCRETE & MORTAR

In the 1980ies, the laboratories of AALBORG PORTLAND A/S, in Denmark, conducted pioneering research to develop very dense cement based binder-matrices, in order to fully exploit the performance of concrete. These efforts resulted in the first ever patented ultra-high performance steel fiber reinforced concrete – bearing the name Compact Reinforced Composite, CRC®. This technology was, and is still today, based on the AALBORG WHITE® white cement, which offers perfectly suited chemistry and purity, as well as superior mechanical performance.

Cementir Group's Innovation Team within INWHITE® Solution, synergizing together expertise from the Research & Quality Centre in Aalborg, Denmark and market/customer driven trends and insights from global Sales Team, is again taking the lead in further developing the very complex binder technology behind high and ultra-high performance in concrete.

AALBORG INBIND® is a white cementitious binder based on Cementir Group's patented limestone calcined clay technology, FUTURECEM®, this binder is the backbone of the entire InWhite ultra-high performance product range, to which each product owes their unique set of fresh and hardened properties. AALBORG INBIND® is a flexible product, that allows the customer to use their own selection of aggregates, pigments, and fibres to target each specific application, getting the technical support from our team of engineers in each step of the way.

# AALBORG INBIND

White cementitious binder to be used in mortar and concrete recipes for high performance and highly aesthetical applications. The flexible binder solution supports precast producers to achieve highly customized UHPC with a selection of local aggregates and suitable admixture. Based on Cementir's patented limestone calcined clay technology FUTURECEM®, the product benefits the manufacturers to have a more sustainable quality product supply and produce high durable and aesthetic high-performance concrete. InBind® is an affordable and efficient solution that allows precast producers to achieve cost reduction of new product development while preserving performances.



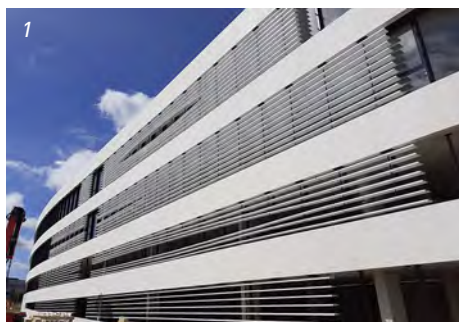
## APPLICATIONS

All around binder suitable for wet-cast applications when high compressive strengths, durability and aesthetics are required. Further uses can be explored on demand.



### 1. UHPC sun-screens

New office building in Bezannes  
Architect: Rudi Ricciotti  
Precaster: Delmar Betsinor



### 2. UHPC façade

New Westminster Secondary School  
Precaster: Centura Building Systems Ltd  
Architect: KMBR Architects



### 3. UHPC structural fence

Swissport handling and office building of Brussels Airport  
Precaster: C-concrete  
Architect: Archipelago and Group Infrabo  
Construction: Cordeel Hoeselt NV



### 4. Outdoor furniture

Grand Hotel Guadalpin in Puerto Banus (E)  
Design: BeTom-Design







White INBIND® is based on FUTURECEM® patented limestone calcined clay technology, which secures a sustainable quality product supply.



FUTURECEM® empowers UHPC product with high level of durability even in the harsh environment, minimized cracks and smooth surface.



Outstanding color performance for high aesthetics value.



Flexible binder solution allows your highly customized UHPC with a selection of local aggregates, pigments, fibres and suitable admixture.



Support your typical industrial production process with a user-friendly binder solution.



Affordable binder product with flexible customization solution model.



Reduced total cost on UHPC development in a most reliable way.



Easy to formulate desired UHPC products in a safe way.



Support from our engineering team to develop a recipe, targeting a specific application, within customer's needs.

## FEATURES

FUTURECEM®

White cementitious binder INBIND® is based on FUTURECEM® patented technology, which offers highly advantageous limestone calcined clay synergy, without being constrained by the availability and quality of by-products from other industries. The product has the following properties,

- High early and final strength
- White colored, thanks to Aalborg White® cement
- Outstanding durability properties of the final mix

# USAGE RECOMMENDATION

InBind® binder is meant to be used as part of a mortar or concrete recipe. Fibres, pigments, and aggregates are not included; therefore, it is always mandatory to carry out a test program to adjust the full recipe, using the combination of additives, aggregates, pigments (when needed) and fibres (when needed) selected by final producer.

The test program must include fresh (i.e flow retention, setting time) and hardened properties (i.e compressive and flexural strength, shrinkage), of the intended recipe, as well as color assessment in the case of pigment addition.

In order to benefit from the ultra-high-performance properties, such as, high strength and durability, it is recommended to fix the water to binder ratio (w/b) between 0,18 and 0,27. The selection of type fibres and dosage will depend on the final application.



## PACKAGING AND STORAGE

InBind® will be delivered in 18kg bags and 900kg big bags.

The material must be kept in a dry place to guarantee its properties during the entire shelf life. For the 18kg bags, a shelf life of maximum 9 months is guaranteed, while the big bags shelf life is 12 months from production date. Please check our Product Information Sheet for further instructions.

## SUSTAINABILITY

In our effort to limit the use of scarce materials, INBIND® empowered by FUTURECEM® patented technology are manufactured with raw materials from sources vastly available in nature. Therefore, it is not constrained by the availability and quality of waste materials from other industries.



# QUALITY STATEMENT

INBIND is produced under strict quality control procedures defined and audited by Cementir Group in order to guarantee the highest quality standards.

## PHYSICAL PROPERTIES

| Physical properties                             | Units              | Typical value |
|---|--------------------|---------------|
| Compressive strength, EN 196-1, 40x40x160mm     |                    |               |
| 1 day   | MPa                | 24            |
| 2 days  |                    | 39            |
| 7 days  |                    | 61            |
| 28 days   |                    | 72            |
| Initial setting time, EN 196-3                  | min                | 175           |
| Standard consistency, EN 196-3                  | %                  | 34            |
| Soundness, EN 196-3                             | mm                 | 1             |
| Fineness, EN 196-6                              | m <sup>2</sup> /kg | 630           |
| Absolute density, EN 196-6, GP                  | kg/m <sup>3</sup>  | 3050          |
| Early stiffening, final penetration, ASTM C 451 | %                  | 55            |
| Hunter L  | -                  | 92,5          |
| Hunter a  | -                  | -1,5          |
| Hunter b  | -                  | 5             |

## CHEMICAL PROPERTIES

| Chemical properties                              | Units | Typical value |
|--|-------|---------------|
| SO <sub>3</sub> , EN 196-2                       | %     | 2,6           |
| Cl, EN 196-2                                     | %     | 0,01          |
| Alkalies, Na <sub>2</sub> O eqv. total, EN 196-2 | %     | 0,24          |
| Water soluble Chromium, EN 196-10                | mg/kg | 0,0           |

## COMPRESSIVE STRENGTH VALUES FOR AN UHPC RECIPE

Since UHPC mixes are the main intended application for InBind®, the table below shows compressive strength values for an UHPC recipe, designed using two different grades of quartz sands, and w/b equal to 0,25. Packing analyses were conducted to select the sand grades and proportions.

Please notice that any changes in the w/b and grades of the sands will cause variations in the mechanical properties of the final mix. These values are meant to be use only as a reference.

| Physical property  | Units | Typical value |
|--|-------|---------------|
| Compressive strength, EN 196-1, 40x40x160mm, w/b = 0,25 (UHPC mix) |       |               |
| 1 day  | MPa   | 75            |
| 28 days  |       | 130           |





## AALBORG INWHITE SOLUTION®

Cementir Group established a global innovation engine for white cement, InWhite®, with the purpose of generating a prioritized and actionable pipeline of high potential customer value proposition global initiatives, bringing new solutions for well-known applications, or completely new applications for white cement based products, aligned to megatrends detected in the society, such as customization, circular economy and high-energy efficient solutions.

The InWhite® process benefits from the Group's global knowledge on both well-established and emerging applications for white cement and technical knowhow of its internationally acclaimed R&D center located at Aalborg, Denmark.

AALBORG INWHITE SOLUTION® has become the umbrella brand for commercialized high value adding and high-performing products, identified and developed under InWhite® initiatives, that Cementir Group will serve to the building industry.



*For technical matters related to the product,  
please address your request to:*

**Inwhitesolution@cementirholding.it**

*For commercial inquiries,  
please find your nearest sales office of AALBORG WHITE® at*

**www.aalborgwhite.com**



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