

# PRODUCT INFORMATION SHEET

## AALBORG EXCEL<sup>™</sup>

### Premixed High-Performance Concrete

**AALBORG EXCEL<sup>™</sup>** is a shrinkage reduced, ready-to-use, self-compacting High-Performance Concrete for the manufacturing of thin/slim concrete products with high aesthetic, mechanical and durability performance. Binder, admixtures and aggregates are included, only water should be added during mixing.

AALBORG EXCEL<sup>™</sup> offers enhanced flow for products with high requirements to surface detailing, in complex mould geometries.

After mixing with water, the product results in a white base coloured High-Performance Concrete for personal tailorization in terms of pigments. Due to its high flowability, fibres can be added to adjust mechanical properties, whilst still maintaining self-compacting properties.

### Applications

- Thin/slim and high compressive and flexural strength aesthetical/architectural panels: facades, cladding, sun-screens, ornamental elements
- Artistic and ornamental elements made in concrete
- Gardening/street architectural elements

### Mixing Instructions

One 25 kg bag of AALBORG EXCEL<sup>™</sup> is mixed with 2.4-2.6 kg water to produce approx. 11.7 liters of High Performance Concrete.

A mixing time of 8 minutes, in a planetary-type mortar or pan-type concrete mixer, is preferred. This may be reduced in high efficiency mixers upon auto-control for benchmark against selected technical properties listed in "Technical properties of the product".

In case pigments are added to the mix, these should be dry mixed with AALBORG EXCEL<sup>™</sup> before adding water. Thereafter, follow recommended mixing procedure above.

## Technical Properties of the Product (water dosage 2.50 kg per 25 kg premix)

Property and Test Method		
	Units	Typical Value
<b>Fresh State</b>		
• Flow		
ASTM C 230/ C 1437-15 <sup>1)</sup> (initial/30 min/45min)	cm	29±2 / 29±2 / 29±2
EN-206 (Initial)	mm	900
• Air content, EN 1015-7	Vol%	2
• Fresh mortar density, EN 1015-7	kg/m <sup>3</sup>	2,325
• Maximum aggregate size	mm	1
<b>Hardening State</b>		
• Hydraulic shrinkage, EN 12617-4 (40x40x160mm) – 90 days	µm/m	700
<b>Mechanical Properties</b>		
• Compressive Strength, EN 196-1, 40x40x160mm		
1 day	MPa	75
28 days		120
• Compressive Strength, diam. 150/300 cylinder		
1 day	MPa	75
28 days		120
• E-modulus, EN 12390-13		
28 days	GPa	50
• Flexural strength, EN 12390-5, 100x100x500 mm		
28 days	MPa	14
• Splitting Tensile Strength, EN 12390-6		
28 days	MPa	10
<b>Durability Properties</b>		
• Chloride content, excl. chloride from mixing water	Wt.% to cement	<0.09%
• Water soluble equivalent alkali content (Na <sub>2</sub> O+0.658xK <sub>2</sub> O), excluding contribution from mixing water	kg/m <sup>3</sup>	< 3.4 (NO alkali silica reactive aggregate is used)
• Chloride Migration, NT Build 492,		
28 days	x 10 <sup>-12</sup> m <sup>2</sup> /s	0.40
90 days		0.17
• Freeze/Thaw Resistance – Scaling, EN 12390-9 (56 cycles)	Kg/m <sup>2</sup>	0.01
• Water absorption, EN 1015-18	kg/(m <sup>2</sup> · min <sup>0.5</sup> )	<0.02 (W <sub>c2</sub> )

1. No shock or agitation applied to the flow table

## Recommendations for its use:

### Trial Casting

AALBORG EXCEL™ turns into a high-flowable mix with excellent mould filling properties. It is, however, always recommended to carry out a trial casting replicating the intended use of the product (representative moulding, release agents if applicable, casting procedure, ...) before production is initiated, to evaluate the achieved surface properties of the finished concrete product.

The above is particularly relevant if fibers are added to the concrete, leading to progressive reduction in flow and increase in viscosity. The trial casting should hence reveal, if vibration must be applied to the mould in order to reach the targeted surface detailing and finishing.

### Auto-control

The user of AALBORG EXCEL™ is expected to implement a quality control testing for monitoring the quality of the mixed concrete against a link to the data mentioned in the table "Technical Properties of the Product", and should at least include:

- Control of water dosage
- Flow and density
- 1 and 28 days compressive strength

### Curing

Due to the low water content in high and ultra-high-performance concretes, it is recommended to protect the concrete from evaporation (e.g. plastic sheet) immediately after casting. In case the free surface needs to be finished after casting, it is also advisable to protect the placed concrete from evaporation in between concrete placement and finishing operations.

The concrete should be protected from evaporation for at least 24 hours, and kept sheltered from rain, wind and dew during the first 7 days after casting.

No heat curing is needed.

## Technology:

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 Holding's Innovation Team within Aalborg INWHITE SOLUTION™, synergising 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 EXCEL™ is based on a Cementir Holdings FUTURECEM®, which offers highly advantageous pozzolanic reactions, but without being constrained by the availability and quality of by-product from other industries.

The performance of AALBORG EXCEL™ in fresh and hardened state has been designed to accurately suit the production flows and requirements of our industrial customers.

## Storage of the product:

Aalborg Excel™ pre-mix in 25 kg bags, stowed on pallets can be stored up to 6 months in total from production date without the dry-mix quality being affected (provided the plastic foil and the bags unbroken).

After the pallets are unwrapped and the plastic foil is broken Aalborg Excel™ in 25 kg bags can be stored up to 3 months without the dry-mix quality being affected.

Max total durability for Aalborg Excel™ in 25kg bags: 6 months + 3 months = 9 months

Aalborg Excel™ pre-mix in 1.0Mt big bags, can be stored up to 12 months in total from production date without the dry-mix quality being affected.

## Packaging:

AALBORG EXCEL™ is available in 25 kg bags and 1.0 Mt BigBags.

## Health & Safety:

**UFI: PUVS-Q1W0-5R0P-HA1A**

AALBORG EXCEL™ is a cement-based material, thus, no extra precautions other than the ones related to handling Portland cement must be considered.

AALBORG WHITE® is the cement used in AALBORG EXCEL™. This cement is neutral in terms of meeting the EU requirements for a maximum soluble chromium (VI) in cement of 2 mg/kg with no time limits on storage time.



Contains: Portland Cement. Danger.  
H315 – Causes skin irritation.  
H318 – Causes serious eye damage.  
H335 – May cause respiratory irritation.  
P102 – Keep out of reach of children.  
P260 – Do not breathe dust.  
P280 – Wear protective gloves, eyes and face protection.  
P305/351/338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P310 – Immediately call POISON CENTER or doctor/physician.  
P501 – Dispose of contents/container in accordance with local regulations.  
Contains: Calcium oxide. When mixed with water it will form calcium hydroxide which has a corrosive effect on skin and eyes.

## Quality Control Assessment:

AALBORG EXCEL™ is produced by a 3<sup>rd</sup> Party under the strict quality control procedures defined and audited by Cementir Holding.

Furthermore, samples are cross-checked and fully tested at Cementir Holdings Research and Quality Centre in Denmark.

## Disclaimer:

**THE HIGHEST CARE HAS BEEN TAKEN TO PROVIDE ACCURATE, UPDATE AND COMPREHENSIVE INFORMATION. HOWEVER, CEMENTIR HOLDING N.V. OR ITS AFFILIATES (THE "COMPANY") SHALL NOT BE HELD RESPONSIBLE FOR ANY CONSEQUENCES ARISING FROM ANY ERRORS OR OMISSIONS IN THE LEAFLET NOR FOR ANY DAMAGE OR ACCIDENTAL LOSS RESULTING FROM THE USE OF THE INFORMATION HEREIN. THE COMPANY RESERVES THE RIGHT TO MODIFY, THROUGH DEVELOPMENT IMPROVEMENTS, THE PRODUCT DISPLAYED IN THIS BROCHURE WITHOUT NOTIFICATION.**

## Sustainability:

In our effort to limit the use of scarce materials, AALBORG EXCEL™ is 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.

## Global Contacts:

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

[inwhitesolution@cementirholding.it](mailto:inwhitesolution@cementirholding.it)

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

[www.aalborgwhite.com](http://www.aalborgwhite.com)