

# ALAG®

## ALAG® 0-4 mm

## ALAG® 4-10 mm

## 1 Description

ALAG® is a hard, dense and heat resistant aggregate used in areas where exceptional durability is required. It is a synthetic calcium aluminate, with an alumina content of approximately 40%. ALAG® is used with calcium aluminate cements, such as CIMENT FONDU® to give a concrete with superior wear resistance in arduous applications.

CIMENT FONDU®/ALAG® concrete combines high early strength with excellent long term properties. It resists abrasion, impact and corrosion as well as tolerating high temperatures and thermal shock / cycling.

Concretes based on CIMENT FONDU® and ALAG® aggregate are ideally suited to the most demanding applications:

- Industrial floors subject to heavy-duty attack: food processing, chemical or petrochemical, iron, steel and non-ferrous metallurgical industries.
- Hydroelectric structures: high abrasion areas in flumes and spill-ways.
- Sewerage network protection: pipes, manholes and associated structures.

It is particularly well suited for the following uses:

- Work requiring very high early mechanical strength.
- Resistance to corrosion by dilute acids (pH > 3.5), sulphates, oils, industrial wastes and aggressive water.
- Areas subject to abrasion, erosion and impact. CIMENT FONDU®/ALAG® concrete offers within few hours superior strength and durability compared with concretes based on Portland cement and hard aggregates such as granite and basalt.
- Cryogenic applications (e.g. concrete areas subject to liquid gas spillage).
- Applications which need to withstand high temperature (up to 1100°C) and thermal shock.

## 2 Specifications

The specification limits indicated are determined with an acceptable quality level (AQL) of 2.5% as defined in the sampling standard ISO 3951.

Usual values represent typical values of our production.

### Chemical Analysis

Principal constituents (%)	Usual values	Specification limit
Al <sub>2</sub> O <sub>3</sub>	37.5 - 43.5	> 36.0
CaO	35.0 - 40.0	< 42.0
SiO <sub>2</sub>	3.0 - 5.0	< 6.0
Fe <sub>2</sub> O <sub>3</sub>	14.0 - 18.0	< 18.5

- Chemical analysis is determined according to EN 196-2.
- Tests conducted prior to crushing and classification.

### Particle size distribution ALAG® 0-4 mm

Sieve size	Cumulative % Passing	
	Usual values	Specification limit
4 mm	95 - 100	> 95
2.5 mm	68 - 88	
1 mm	32 - 54	
500 µm	20 - 34	
200 µm	7 - 17	
100 µm	1 - 9	< 15

### Particle size distribution ALAG® 4-10 mm

Sieve size	Cumulative % Passing	
	Usual values	Specification limit
12.5 mm	100	
10 mm	84 - 100	> 84
8 mm	55 - 81	
6.3 mm	33 - 63	
5 mm	15 - 35	
4 mm	6 - 14	< 20

### 3 Additional data

This information is given for guidance only.

#### Physical properties

- Open porosity: none
- Hardness (Mohs): 7 - 8
- Density : 3.25 g/cm<sup>3</sup>
- Bulk density :
  - ALAG<sup>®</sup> 0-4mm :1650 - 1700 kg/m<sup>3</sup>
  - ALAG<sup>®</sup> 4-10mm :1600 - 1650 kg/m<sup>3</sup>

### 4 Concrete/mortar properties

This information is given for guidance only.

#### Technical data on CIMENT FONDU<sup>®</sup>/ALAG<sup>®</sup> concrete

- Water/cement ratio < 0.40
- Composition : See "mix design"

	Mechanical strength at 20°C		
	1 day	7 days	28 days
Compressive (MPa)	50	60	70

♦Tests conducted on 16 x 32 cm cylinders according to NF P 18 406

♦CIMENT FONDU<sup>®</sup>/ALAG<sup>®</sup> concrete is subject to the conversion phenomenon; only strength after conversion should be considered for design purpose.

	Strength after heating Treatment temperature		
	110°C	800°C	1100°C
Flexion (MPa)	9.0	6.5	3.2
Compression (MPa)	95	72	23

♦Tests conducted on 40x40x160mm prisms; All samples immersed in water for 24 hours then held for 24 hours at 110 °C; remaining samples held at 800 °C or 1100°C and then cooled slowly.

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The compressive strength of CIMENT FONDU<sup>®</sup>/ALAG<sup>®</sup> concrete develops in a similar way to concretes made with CIMENT FONDU<sup>®</sup> and natural aggregates, including the fact that it is subject to the conversion phenomenon. See the CIMENT FONDU<sup>®</sup> Product Data Sheet for more information.

CIMENT FONDU<sup>®</sup>/ALAG<sup>®</sup> concrete gives exceptional high strengths within 24 hours after placing. This feature is useful to ensure fast return to service which allows a reduction in the overall downtime.

Guidance on the correct application of CIMENT FONDU<sup>®</sup>/ALAG<sup>®</sup> concrete is available from our technical department.

#### Mix Design

The mix design employed when using CIMENT FONDU<sup>®</sup>/ALAG<sup>®</sup> concrete will depend on the type of application, thickness of the concrete, method of placing, and degree of workability required.

Typical composition of mortars and concretes per cubic metre:

		CIMENT FONDU <sup>®</sup>	ALAG <sup>®</sup> Fine 0 - 4 mm	ALAG <sup>®</sup> Coarse 4 - 10 mm
Mortar Thickness < 50 mm	Parts by weight	1	3	-
	Dosage	600 kg	1800 kg	-
Concrete Thickness > 50 mm	Parts by weight	1	2	2
	Dosage	515 kg	1030 kg	1030 kg

- ♦Yield based on a water/cement ratio of 0.40
- ♦These typical mix design are given for guidance only

### 5 Storage

ALAG<sup>®</sup> must be stored in dry conditions off the ground.