

# CIMENT FONDU®



**Special cement for concrete  
and mortar solutions**

# >> Rapid return to service



## Rapid hardening: more than 25 MPa in 6 hours

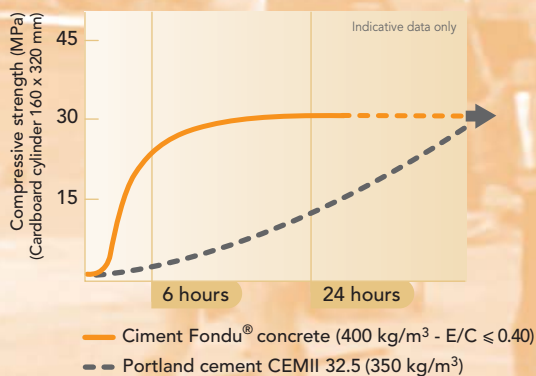
Ciment Fondu® mortars and concretes are very rapid hardening, with a setting time similar to Portland cement. This rapid speed of hardening enables concrete construction which requires fast return to service, within time constraints that cannot be met by conventional concretes, even accelerated concretes.



## Rapid drying: residual moisture below 3% within 48 hours

The high reactivity of Ciment Fondu® produces concrete that rapidly attains a residual moisture level below 3% within 2 days. By comparison, traditional concretes take several weeks to achieve such a low value.

This moisture threshold is important as it is often specified as the content required before a floor covering (resin topping, adhesive, parquet) may be applied.



> A specific feature of Calcium Aluminate concrete is the phenomenon of conversion. Only the long term strength – i.e. after conversion – should be used for design purpose.

More information about conversion is given at the end of this brochure and in Ciment Fondu® commercial data sheet.



> **Industry:**  
Floors and slabs covered with resin topping, epoxy, paint, adhesive for tiles.

> **Buildings:**  
Floors and slabs covered with parquet, plastic liner, tiles.



> **Pavement repairs:**  
Roads, airports, car parks.

> **Industrial floors:**  
Shutdown repairs, machine bases.

> **Underground works**



# >> Resistance to harsh conditions



## Resistance to abrasion

Ciment Fondu® produces concretes with better resistance to abrasion than a Portland cement concrete. Abrasion resistance can be even further enhanced by using hard aggregates. The use of Alag® aggregates with Ciment Fondu® produces concrete with exceptional resistance to abrasion.



Effect of a rotary grinder  
(ASTM C779 modified)



**> Industry:**  
Discharge areas, areas trafficked by heavy vehicles, channels subject to abrasion from liquids carrying abrasive particles.

**> Hydraulic:**  
Protection of flood gates, sluice beds, spillways.



## Low temperature concreting

Due to the rapid hardening of Ciment Fondu®, the heat released in the first few hours after setting is sufficient to enable concreting in sub-zero conditions, down to -10°C.

Concreting in freezing conditions requires specific caution, more information is given at the end of this brochure.



**> Industry:**  
Floor repairs in cold stores, tunnel freezers.

**> Civil engineering:**  
Work in winter conditions or in mountain regions.





## High temperature and thermal shock resistance

The high alumina content and absence of free lime enable Ciment Fondu® concrete to resist extremes of temperature and repeated thermal shocks. In these applications, the maximum temperature allowed is also function of the aggregate type. The combination of Ciment Fondu® with Alag® aggregates resists temperatures up to 1,100°C.



- > **Metallurgic industries:**  
Furnace bases, discharge areas, coke wharfs, incinerators.
- > **Protection from fire:**  
Fire training areas, fire training buildings.
- > **Others:**  
Rotary furnace linings, liquid gas discharge areas.



## Corrosion resistance

Ciment Fondu® concrete provides excellent resistance to chemical attack from a wide range of aggressive substances including several acids (pH≥4), sugar solutions, grease and fats. Ensuring low porosity (low W/C) and using appropriate aggregates further enhances the corrosion resistance.



- > **Industry:**  
Floors in chemical and food processing factories, silo lining, settling tanks.



- > **Petrochemical:**  
Sulphur pits.
- > **Sewage:**  
Protection of sewage pipes, curved channels.
- > **Seawater exposed areas**



# >> Properties

Ciment Fondu® conforms to EN 14647 Standard.

It produces concretes combining rapid hardening, good workability and high durability.

## Rapid return to service



### Rapid hardening

Strength over 25 MPa around 6 hours after casting.



### Rapid drying

Residual moisture below 3% within 48 hours.

## Resistance to harsh conditions



### Abrasion

Excellent abrasion resistance.  
Even better when using Alag® aggregates for extreme conditions.



### Cold

Installation at sub-zero temperature (down to -10°C).



### Temperature

Resistance to extreme temperature and thermal shocks (from -180°C to +1,100°C) using Alag® aggregates.



### Corrosion

Resistance to corrosion, including several diluted acids (pH ≥ 4).  
Improved resistance when using Alag® aggregates (pH ≥ 3.5).



For more information, visit us on:  
[www.cimentfondu.com](http://www.cimentfondu.com)

## Our teams at your service around the world

Ciment Fondu® is manufactured according to the latest procedures and technical controls developed by Kerneos industrial and research teams.

Ciment Fondu® is produced and controlled in Kerneos plants within a quality management system that is certified according to ISO 9001

Standard requirements, in order to ensure uniform and regular deliveries around the world.

Ciment Fondu® is supported by the technical, commercial and marketing network dedicated to Technical Concrete applications.

# >> Recommendations for using Ciment Fondu®

## Raw materials

**> Cement content:** The minimum cement content for Ciment Fondu® shall be 400kg/m<sup>3</sup>.

For Ciment Fondu®/Alag® concrete, please refer to the recommendations of the Alag® brochure.

**> Water content:** The Water/Cement ratio (W/C) should be  $\leq 0.40$ . Only clean drinking water should be used for gauging.

**> Aggregates:** Depending on the application of a given Ciment Fondu® concrete, appropriate aggregates must be selected. For applications with severe abrasion, corrosion or thermal shock, it is recommended to use Alag® aggregates.

**> Admixtures:** Before using an admixture with Ciment Fondu®, its efficiency must be validated.

## Production and placing

Ciment Fondu® concrete can be produced and delivered by ready-mix producers, or produced on site using a drum mixer.

**> Workability:** Ciment Fondu® concrete typically has a firm consistency.

**> Vibration:** Ciment Fondu® concrete must be consolidated by vibration during placing. Normal codes of practice apply.

**> Curing:** The rapid hardening of Ciment Fondu® is accompanied by rapid heat release. Therefore, it is necessary to begin curing as soon as setting takes place, with appropriate means (plastic film, wet burlap, curing compound, etc.).

**> Joints:** Shrinkage occurs faster with Ciment Fondu® and experience shows that joints need to be more closely spaced than joints in conventional concrete.

Production in sub-zero temperature as low as -10°C: the release of heat occurs after the beginning of setting. It is therefore essential to prevent the concrete from freezing before the initial set occurs. This can be achieved by using warm water (or even hot water) and protecting aggregates from cold. Once cast in place, the concrete must be protected from freezing for 4 to 5 hours with an insulating blanket or other appropriate means.



## Durability and conversion

As with all hydraulic binders, the long term strength of Ciment Fondu® concrete depends on the mix design and constituents, in particular the Water/Cement ratio and the nature of aggregate.

A specific feature of Ciment Fondu® concrete is the conversion phenomenon. This phenomenon is characterized by a high temporary strength which diminishes over time to a lower long term strength. When the conversion of the hydrates is completed, the long term strength will be stable. Only the strength after conversion should be considered for design purposes.

As an indication, it can be estimated that Ciment Fondu® concrete produced according to modern codes of practice ( $W/C \leq 0.40$ ) with good quality aggregates will achieve compressive strength, after conversion, around 25 MPa when measured on cylinders or around 30 MPa when measured on cubes. It is possible to obtain higher strength by modifying the mix design (reduction in the Water/Cement ratio, use of workability aids/plasticizers as well as the nature and grading of the aggregate).

For more information, visit us on:  
[www.cimentfondu.com](http://www.cimentfondu.com)

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