CIMENT FONDU®

Product Data Sheet

Industrial Plasters
Proven Reliability

1 General characteristics

CIMENT FONDU® is a hydraulic binder based on calcium aluminates. It differs significantly from Portland Cement in which the key mineralogical phases are calcium silicates. Calcium aluminates provide specific properties which are ideally suited to dry mix mortars for the construction industry: rapid setting, rapid hardening, quick drying, size variation control, high strength, abrasion and corrosion resistance.

CIMENT FONDU® is commonly used either alone or in combination with other hydraulic binders, fillers and polymers in many formulated products. These include products for floor preparation (self levelling compounds, screeds,.etc.), tile laying (adhesives, grouts), rapid repair or assembly of materials (e.g. non shrink grouts).

When used alone, although its setting time is similar to Portland Cement, it offers rapid strength development. Unlike Portland cement, **CIMENT FONDU®** does not release free lime during hydration. In concretes and mortars with a low porosity, this property gives a good resistance to acid attack and eliminates the major cause of efflorescence.

CIMENT FONDU® is an accelerator of Portland cement in formulated products, and is particularly recommended for mixes where speed and high performance are required.

CIMENT FONDU® is very versatile and is a key component in many high range formulated building products. With calcium sulfate it allows the formulation of a wide range of properties together with excellent consistency.

CIMENT FONDU® is produced and controlled within a quality management system that is certified according to ISO 9001.

2 Specification

The properties of **CIMENT FONDU®** produced in Europe conform to the requirements defined in the norm: EN 14647: “Calcium Aluminate Cement”.

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

The strict specification limits define the absolute limits of product conformity applicable for individual values.

The EN specification limits are conformed with the requirement defined in the norm EN 14647.

The usual range represents typical values of production.

Chemical composition
Main constituents (%)

	Usual range	Specification limit
Al_2O_3	37.5 - 41.0	>37.0
CaO	35.5 - 39.0	<41.0
SiO_2	3.5 - 5.5	<6.0
Fe_2O_3	13.0 - 17.5	<18.5
MgO	-	<1.5
TiO_2	-	<4.0

Other constituents (%)

	Strict specification limit
S (as sulphide ions)	≤0.1
Cl (as chloride ions)	≤0.1
$Na_2O + 0,659\ K_2O$	≤0.4
SO_3	≤0.5

The chemical characteristics of **CIMENT FONDU®** have been determined according to the following:

* EN 196-2: Methods of testing cement - Chemical analysis of cement.

Fineness

	Usual range	Specification limit
Blaine Specific surface (cm^2/g)	2850 - 3450	>2700

* Determined in accordance with EN 196-6: Methods of testing cements - Measurement of fineness.

Neat paste setting time

	Usual range	Specification limit
Initial set (min)	180 - 300	>120
Final set (min)	210 - 330	<480

* Determined in accordance with EN 196-3: neat cement paste at standard consistency; mechanical mixing; Vicat test equipment using 300g weight; temperature 20°C; relative humidity >90%.

Mechanical strength

Compressive strength (MPa)		
Age	Usual range	Strict specification limit
6h	35 - 50	>30
24h	60 - 80	>50

* Composition of mortar according to EN 14647: 1350g of sand, 500g of calcium aluminate cement, 200g of water.

* Test conditions according to EN 196-1: test prisms 40x40x160mm; temperature 20°C; prisms cured at >90% relative humidity for 24 hours (NF standard) or 6h (BS standard), followed by immersion in water.

3 Additional data

This information is given for guidance only.

- Principal mineralogical phase*: CA
- Secondary phases*: $C_{12}A7$, C_2S, C_2AS, C_4AF
  * C=CaO, A=Al_2O_3, S= SiO_2, F=Fe2O3
- Bulk density: 1100 kg/m^3
- Specific gravity: 3.2 - 3.3 g/cm3
- Pyrometric cone equivalent (on neat cement paste): 1270 - 1290 °C
- Heat of hydration 6h 340kJ/kg
  24h 445kJ/kg
  5 days 445kJ/kg

Beyond the minimal requirements of the standard EN 14647, the French production benefits from controls and complementary requirements such as defined in the reference frame NF 002.

Workability - French production

The workability of **CIMENT FONDU®** has been determined by measuring the flow properties using the ASTM C230 flow table. The test is carried out using a standard siliceous sand mortar.

	Specification limit
Spread after 15min (%)	>30

* Composition of mortar according to EN 14647: 1350g of sand, 500g of calcium aluminate cement, 200g of water.

* Test carried out with 25 shocks after 15 min retained in cone mould, d1 (diameter of base)= 100mm. % of flow= d2 (mm) - d1 (mm).

Mortar setting time - French production

* Composition of mortar according to EN 14647: 1350g of sand, 500g of calcium aluminate cement, 200g of water.

* Preparation according to EN 196-1.

	Usual range	Specification limit
Initial set (min)	130 - 200	>120
Final set (min)	140 - 220	<240

* Measurement according to NF P15-431: Vicat test equipment as EN 196-3 but using a 1000g test weight; temperature 20°C; samples immersed in water or cured at >90% relative humidity.

* Final setting time measured in accordance with NF P15-330: the Vicat needle no longer penetrates the mortar.

Mechanical strength - French production

* Composition of mortar according to EN 14647: 1350g of sand, 500g of calcium aluminate cement, 200g of water

Mechanical strength in MPa		
Age	Modulus of rupture strict specification limit	Compressive strength strict specification limit
6h	>4	>30
24h	>5	>50
28d	>6.5	>60

* Measurement according to NF P15-431: Vicat test equipment as EN 196-3 but using a 1000g test weight; temperature 20°C; samples immersed in water or cured at >90% relative humidity.

* Final setting time measured in accordance with NF P15-330: the Vicat needle no longer penetrates the mortar.

4 Storage and Shelf Life

As with all hydraulic binders, **CIMENT FONDU®** must be stored in dry conditions, off the ground.

	Shelf Life
25kg	12 months
5kg	24 months

5 Voc Classification

According to French regulations (2011/04/19), regarding the labelling of construction products for Voc emissions.

The tested product must adhere to the following levels of emission.

Emission class are based on measures done at 28 days in closed chamber, or before this delay if emissions respect requirements of lowest emission class (A+).

Exposure limits per µg/m3 of air

Class	C	B	A	A+
Formaldehyde	>120	<120	>60	<10
Acetaldehyde	>400	<400	>300	<200
Toluen	>600	<600	>450	<300
Tetrachloroethylen	>500	<500	>300	<250
Xylen	>400	<400	>300	<200
1,2,4 - Trimethylbenzen	>2000	>2000	>1500	>1000
1,4-Dichlorobenzen	>120	<120	<90	<60
Ethylbenzen	>1500	<1500	<1000	<750
2-Butoxethanol	>2000	<2000	<1500	<1000
Styren	>500	<500	<350	<250
VOCT	>2000	<200	<1500	<1000