



IMERYS

# FONDAG<sup>®</sup>

The ultimate concrete for extreme  
industrial environments



Here for generations

# The ultimate concrete for extreme industrial environments

FONDAG® is a ready-to-use, high strength, durable concrete. Its special characteristics are achieved by combining strong, hard, dense and non-porous synthetic aggregates which develop very strong chemical and mechanical bonds with calcium aluminate cement.

FONDAG® shows the unique capacity to resist aggressive environments where high temperature, thermal and mechanical shocks, abrasion and corrosion, are all present.

In many severe industrial environments where Portland cement concrete and specialty products deteriorate rapidly, FONDAG® is the logical solution for long term durability.



## Properties



### Temperatures

Withstand temperature from -180°C to +1100°C and thermal shocks.



### Abrasion, erosion and impact

Extremely good resistance to abrasion, erosion and impact.



### Corrosion

Resists corrosion by sulphates, oils, industrial effluents, aggressive chemicals and dilute acids for pH 3.5 – 11.



### Rapid hardening

Back in service if necessary within 6 to 8 hours after placing.

## Preparation



With drum-mixer



With ready-mix truck

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Imerys Aluminate warrants that the products comply with the specifications stated in the commercial data sheet to the exclusion of any other warranty, expressed or implied. Imerys Aluminate makes no representation or warranty of any kind, either expressed or implied, as to the merchantability or fitness for a particular purpose or use of the products. The warranty shall be limited to the replacement of the non-conforming products or, at Imerys Aluminate's option, the refund of the purchase price. Any technical advice, recommendations or information are given based on Imerys Aluminate's current knowledge and experience of the products and are deemed to be accurate. However, Imerys Aluminate undertakes no liability or responsibility of any kind in respect thereof. Users are invited to check that they have the latest version of this document.

## Our teams at your service around the world

Imerys plants share identical quality standards, within a quality management system that is certified according to ISO 9001 Standard requirements.

Imerys' Fondag® offer is supported by the global technical, commercial and marketing network, dedicated to Technical Concrete applications.

# Resistance to extreme temperature and thermal cycling from -180°C to +1100°C

## Metalurgical Plants and Foundries

- Blast furnace and furnace area floors
- Ladle pre-heat and cooling areas
- Cast house floors
- Slag pit and drop-out boxes
- Quench towers and track repairs
- Oxygen lance cutting areas
- Heat resisting floors
- Coke discharge areas

## Cement plants

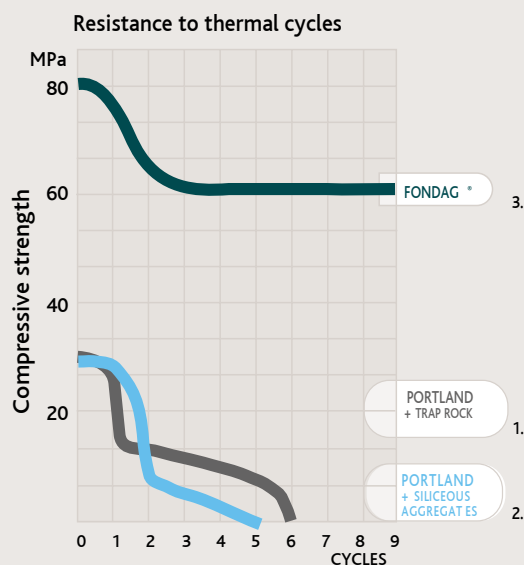
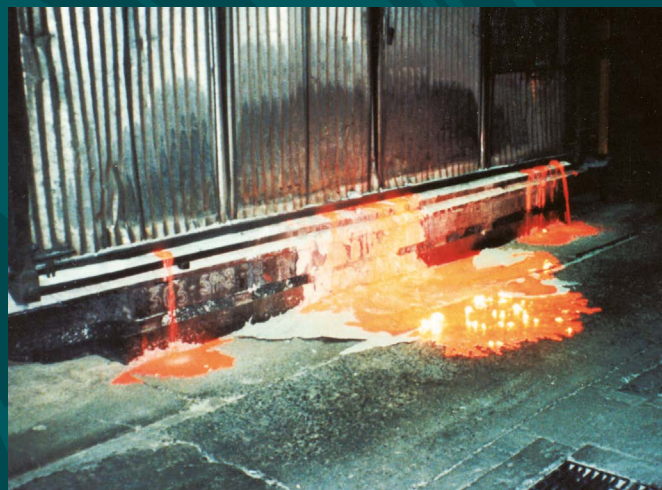
- Pipe lining
- Raw materials silos
- Cyclones
- Coolers
- Hoods and other areas subject to high temperatures

## Fire Training Centers

- Flammable products retention tank
- Fire training Centers

## Incinerators and boilers

- Charging chutes
- Ash boxes
- Burning pits



Thermal cycle is 24 hours at 20°C moist, 24 hours at 110°C drying and 6 hours at 500°C.

MIX	CEMENT	SAND	GRAVEL	CYCLES
1*	PORTLAND	Trap rock	Trap rock	4
2*	PORTLAND	Siliceous	Siliceous	3
3	FONDAG *			9

\* All mixes proportioned at 1 part cement, 1.7 parts sand, 2.2 parts 10 mm gravel.



# Technical details

FONDAG® combines a very hard, high density, fused synthetic aggregate containing 40% alumina with calcium aluminate cement. Because the aggregate and the binder are mineralogically the same, there is an ideal chemical affinity resulting in a unique and stronger paste-aggregate bond.

Physical characteristics of the synthetic aggregate and of the cement, such as coefficient of expansion, are also the same. This explains the exceptional thermal, mechanical, and chemical properties of FONDAG®.

Under the FONDAG® brand, there exist a wide range of products answering the specific needs of users in different regions. The products are available in big-bags or in paper bags. For more information, please contact your local Imerys representative.

## Some physical properties

- Aggregate size: 12 mm
- Open porosity after 28 days at 20°C: 5%
- Mohs hardness of aggregates: 6-7
- Working Time: 1-3 hours depending of admixture use

## Mechanical properties (indicative data)

### Compressive Strength on 100 mm cubes with 20°C moist curing

6 hours after mixing	30 MPa
24 hours after mixing	50 MPa
Long term compressive strength to consider for design 40 MPa purpose (converted strength*)	40 MPa

\*only strength after conversion must be considered for design purpose.

### Strength after Heat Treatment

	Dried at 110°C	Fired at 800°C	Fired at 1,100°C
Flexural (MPa)	9	7.5	3.0
Compressive (MPa)	70	50	25

Tests conducted on 40 x 40 x 160 mm prisms. All samples immersed in water for 24 hours then held for 24 hours at 110°C, some samples held for a further 6 hours at 800°C or 1100°C and then cooled down gradually.

## Mixing, placing & curing recommendations

- FONDAG® is a ready-to-use pre-blend concrete. It is essential to observe the water content specified on bags to obtain expected properties.
- Mixing equipment must be clean and free from concrete build up. Mixing time required is 5 minutes minimum. FONDAG®, in the plastic stage, appears similar to a firm Portland concrete.
- If the specification requires joints, they should be done promptly because more than 60% of shrinkage occurs within 2 days after placement; saw cut joint must be done immediately after the final set.
- Like for Portland cement concrete, proper curing is essential to ensure satisfactory surface condition of FONDAG®. The appropriate curing method should be chosen to be effective for the actual job site conditions (either application of wet burlap, water spray, plastic sheets or any other appropriate means). Curing should be ensured in both hot and cold ambient conditions.
- Cold weather installation: provided that the fresh concrete is prevented from freezing until heat evolution begins, the curing temperature can be as low as -18°C. Depending on additional admixtures utilized, the time to reach this exothermic reaction can vary from a few minutes to several hours.

See bags and Product Data Sheet for more detailed mixing, placing and curing recommendations.

FONDAG® specific chemistry shows an excellent corrosion resistance to a wide range of aggressive substances (pH 3.5 – 11) including several acids, sugar solutions, grease and fats, etc.

FONDAG®, characterized by a high alumina content and absence of free lime, is extremely stable at high temperature and in conditions of severe thermal cycling and thermal shock. In the same conditions, Portland cement based concrete becomes unstable and experiences spalling, expansion and eventual failure.

FONDAG® is a concrete with low porosity and high density, based on very hard synthetic aggregates allowing abrasion resistance several times better than 35 MPa Portland cement concrete.

# Resistance to abrasion, mechanical abuse and corrosion

## Industrial Flooring

- Heavy equipment tracks
- Shop floors
- Warehouses
- Bulk material unloading areas and transfer pads

## Hydraulic Structures

- Sills
- Screening walls
- Spillways
- Scouring sluices
- Collectors
- Jetty heads
- Sluice beds

## Food Processing Industries

- Discharge areas
- Factory floors
- Cold rooms
- Freezing tunnels

## Petrochemical Industries

- Sulphur pits
- Industrial floors

## Chemical Specialties

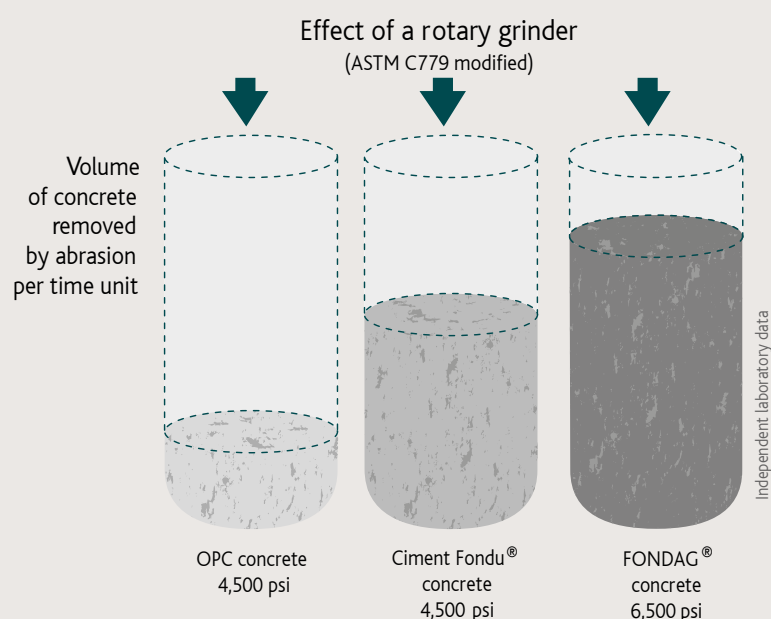
- Decantation basins
- Effluent and sea water channels
- Factory floors
- Cryogenic loading and discharging areas
- Wastewater assets exposed to H<sub>2</sub>S corrosion
- Surface exposed to intermittent corrosive effluents

## Abrasion from ore transfer

- Ore pass lining
- Ore silo lining
- Crusher pad flooring

## Other Mining Application

- Ore sludge channel lining
- Track road repairs
- Mine floor exposed to acidic run-off



# The world leader in mineral-based specialties for industry



Over **15,000**  
customers



Sales in **142**  
countries



**€4.4bn**  
revenue

## At Imerys, we fulfill our role in society in a responsible way.

The technical expertise and innovative mindset of our people enable us to extract and transform minerals responsibly and in a sustainable way over the long term.

### Empowering Our People



Increase women in senior management to 30% by 2022<sup>1</sup>

### Caring For Our Planet



Reduce CO2 emissions (in tCO2/€) by 36% by 2030<sup>2</sup>

### Building For The Future



Assess 40% of portfolio<sup>3</sup> against sustainability criteria by 2022



act4nature  
international



Sustainable  
Development  
Challenge



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**Notes:** <sup>1</sup> And fully implement the Group Diversity and Inclusion 3-year program.  
<sup>2</sup> Target approved by the Science Based Target initiative.  
<sup>3</sup> By revenue.