

## FONDAG®

The ultimate concrete for extreme industrial environments

Here for generations

# The ultimate concrete for extreme industrial environments

FONDAG<sup>®</sup> 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<sup>®</sup> 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<sup>®</sup> is the logical solution for long term durability.

#### **Properties**



#### Temperatures Withstand temperature from -292°F to 2012°F and thermal shock.



## Abrasion, erosion and impact

Extremely good resistance to abrasion, erosion and impact.



#### Corrosion

Resists corrosion by sulfates, 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

FONDAG<sup>®</sup> is a trademark of Imerys.



With ready-mix truck

## 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<sup>®</sup> offer is supported by the global technical, commercial and marketing network, dedicated to Technical Concrete applications.

Imerys Aluminates 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 Aluminates 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 Aluminates option, the refund of the purchase price. Any technical advise, recommendations or information are given based on Imerys Aluminates current knowledge and experience of the products and are deemed to be accurate. However, Imerys Aluminates 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.





### Resistance to extreme temperature and thermal cycling from -292°F to 2012°F

#### 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

#### **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 68°F moist, 24 hours at 230°F drying and 6 hours at 932°F.



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

\* All mixes proportioned at 1 part cement, 1.7 parts sand, 2.2 parts 3/8" aggregate.



### **Technical details**

FONDAG<sup>®</sup> 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<sup>®</sup>.

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

#### Some physical properties

- Aggregate size: 3/8"
- Open porosity after 28 days at 68°F: 5%
- Mohs hardness of aggregates: 6-7
- Working Time: 1-3 hours depending of admixture use

#### Mechanical properties (indicative data)

Compressive Strength on 4" cubes with 68°F moist curing				
6 hours after mixing	4,000 psi			
24 hours after mixing	7,000 psi			
Change to Long term compressive strength to consider for design 5,000 psi (converted strength*)	5,000 psi			

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

Strength after Heat Treatment					
	Dried at 230°F	Fired at 1472°F	Fired at 2012°F		
Flexural (psi)	1,300 psi	1,000 psi	400 psi		
Compressive (psi)	10,000 psi	7,000 psi	3,000 psi		

Tests conducted on 40 x 40 x1 60 mm prisms. All samples immersed in water for 24 hours then held for 24 hours at 230°F, some samples

• Water content: ≤ 10% (1/2 gallon of water per 50-lb bag).

 Open porosity after 28 days at 68°F: 5%

## Mixing, placing & curing recommendations

- FONDAG<sup>®</sup> 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<sup>®</sup>, 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 24 hours 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 0°F. 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<sup>®</sup> 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.

held for a further 6 hours at 1472°F or 2012°F and then cooled down gradually.

FONDAG<sup>®</sup>, 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 5,000 psi Portland cement concrete.

**IMERYS** 

## 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**

- Sulfur pits
- Coke discharge areas
- Industrial floors

#### **Chemical Specialties**

- Decantation basins
- Effluent and sea water channels
- Factory floors
- Cryogenic loading and discharging areas

#### Abrasion from ore transfer

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

## Other abrasion problems in mining

- Ore sludge channel lining
- Track road repairs
- Other highly abraded areas







## The world leader in mineral-based specialties for industry





#### 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>

SCIENCE BASED TARGETS



**Building For The Future** 

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





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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.

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