DIASIL

Effective solutions for the construction industry

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- **Do you want to have homogeneous mortars and the high water-retention of mixtures?**
- **Do you want your material to be more strongly bonded to the foundation ?**
- **Do your mixtures experience a caking effect when they are stored?**
- **Do you want a mixture with good consumer and performance properties?**

DIASIL is the best solution for you!

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What is DIASIL?

DIASIL is an amorphous silica used as a functional filling agent in dry building mixtures, mortars and concrete

DIASIL can be used for the improvement of the rheological characteristics of mortar and the production of composites with higher performance and better technical properties

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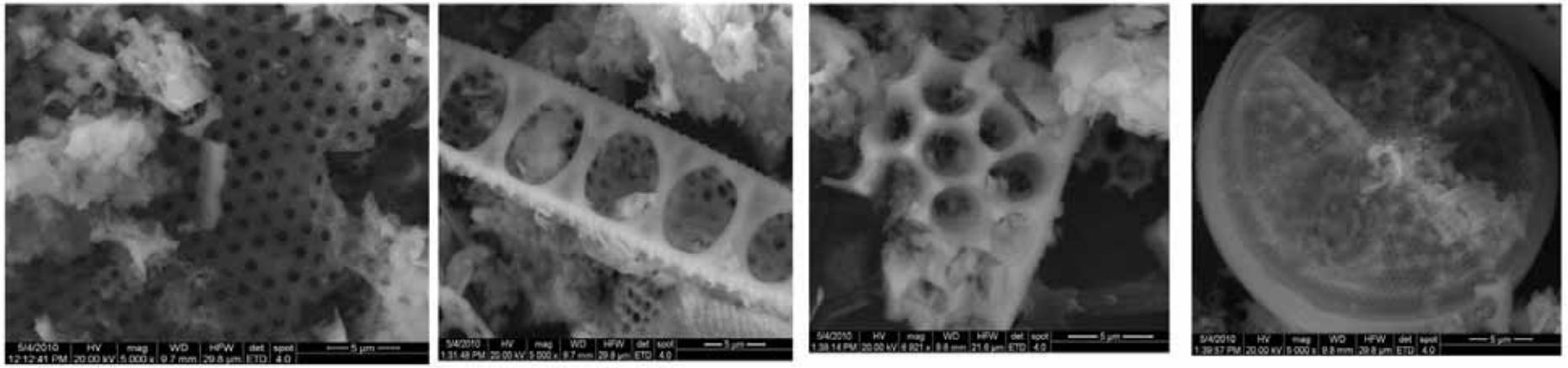
Unique diatoms

DIASIL is made from the unique natural material – diatomite - by means of its special thermal treatment

Diatomite is a sedimentary silica rock consisting of tiny folds of ancient diatomite algae - diatoms – highly porous amorphous silica



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How DIASIL works?

DIASIL leads to multiple structural bonds in cement and gypsum systems and, in particular, to the thixotropic effect that results in significant improvement of the consumer properties of construction mortars

Adding DIASIL at a rate of just **3-5%** of the cement mass is sufficient for the improvement of the consumer and performance properties of building mixtures

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Action of DIASIL

- Highly developed surface area and pozzolanic activity of BIOSILICA promote the accumulation of calcium hydrosilicate in a setting mortar, the increase of strength and reduction of capillary porosity of the cement rock by means of structure consolidation due to the pozzolanic reaction

$$SiO_2 + Ca(OH)_2 + n(H_2O) \longrightarrow (B)CaO \bullet SiO_2 \bullet H_2O$$

- Owing to its space structure, DIASIL prevents from adhesion of fine powders to the working surfaces of the mixer during production process and reduces caking effect when storing

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Properties of DIASIL

Main properties of DIASIL:

- High SiO_2 content
- High hydraulic activity
- High porosity
- Chemical stability, anti-caking effect
- Light dispersability
- Low density
- Low thermal conductivity

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Physical and technical properties of DIASIL

Characteristic	Value
Mesh plus № 01 by weight	< 10,0
Moisture by weight , %	< 3,5
Bulk density, kg/m³	< 400,0
pH of water extract	7,2
SiO_2 by weight, %	> 85,0
Specific surface, m²/g	> 20,0
Hydraulic activity, mg/g, 30 days (15 titres)	> 248,0
Porosity, %	> 70,0

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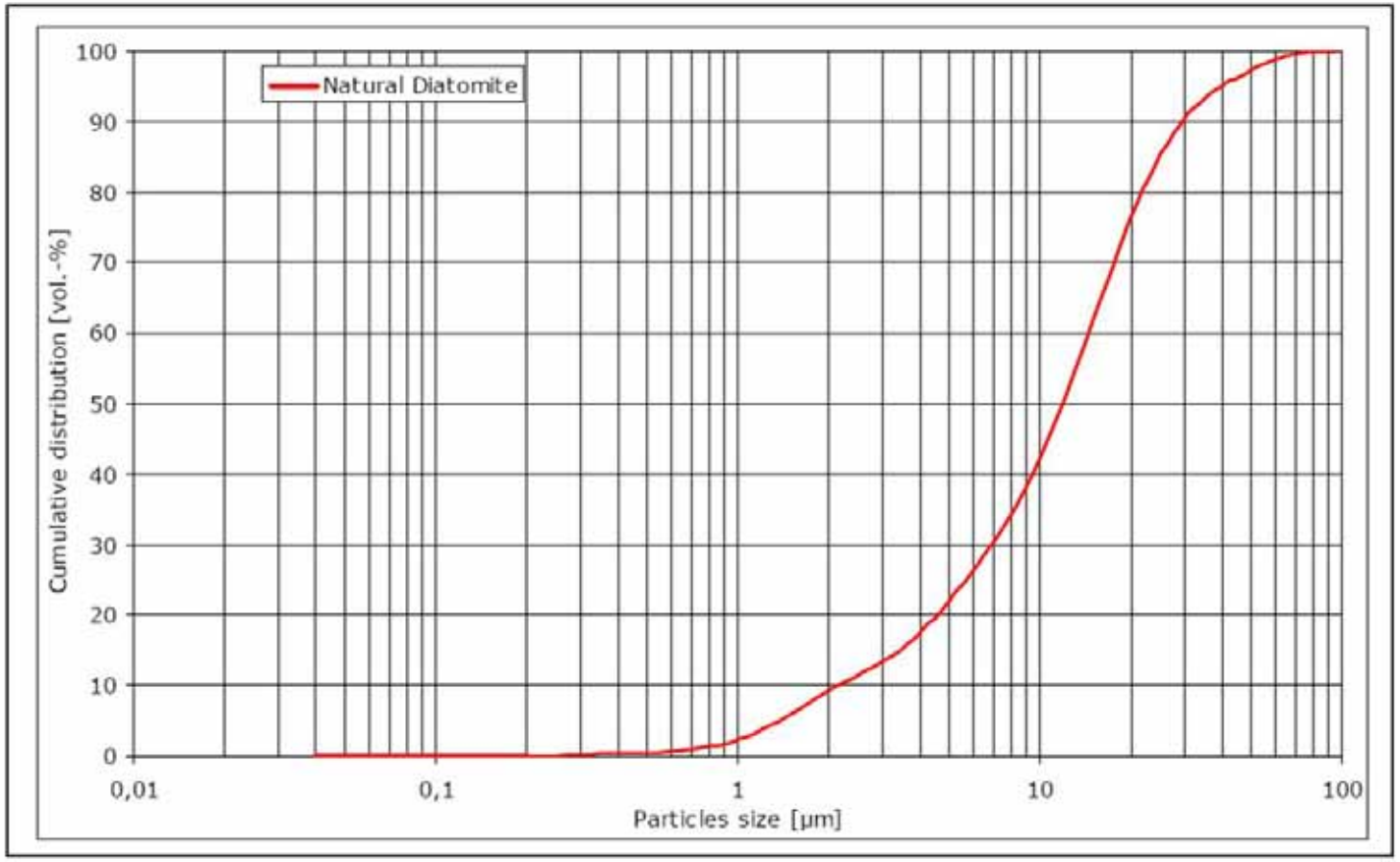
Particle size distribution of DIASIL



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Application advantages of DIASIL

- Thixotropic effect in mortars when used on vertical and inclined surfaces
- Uniform distribution of components in the mixture, anti-caking effect of the mixture when stored
- Homogeneity of mortars and improvement of water retention properties
- Consolidation of the structure, increase of water resistant properties for materials used in contact with water
- Increase of frost resistance
- High bonding strength with foundations

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Outstanding features of DIASIL

- Unique structure
- Chemical inertness
- High porosity (up to 85% of volume)
- Low apparent density
- High absorption capacity
- Hardness in conjunction with fragility
- Well-developed specific surface

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Application of DIASIL

- Dry building mixtures
- Lightweight cements
- Foam concrete of low density
- Ceramsite concrete
- Mixtures for industrial floors
- Production of lime and silica binding material
- Production of magnesian binding material
- Gypsum and cement pozzollanic binding material

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Basic formulations

Block cement glue

BASIC COMPOUND	ECONOM	STANDARD	IMPROVED
1. Mineral components			
Portland cement	26	35	40
DIASIL	***2***	***3***	***4***
Silica sand 0,1-0,3 mm	72,8	61,8	55,8
2. Admixtures			
Cellulose ester of medium viscosity	0,2	0,2	0,2
Redispersible polymeric powder	-	1	2

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Basic formulations

Lime and cement plaster

BASIC COMPOUND	FIRST LAYER	FINAL LAYER
1. Mineral components		
Portland cement	15	15
Burnt lime $Ca(OH)_2$	7,3	6
DIASIL	***5***	***5***
Lime flour $CaCO_3$ 40-100 mcm	12	7
Silica or lime sand 0,1-1,3 mm	62,4	-
Silica or lime sand 0,1-0,3 mm	-	68
2. Admixtures		
Cellulose ester (high or medium viscosity)	0,07	0,05
Redispersible polymeric powder	-	0,65
Porous agent	0,01	0,01
Starch ester	0,02	0,02
Hydrophobisator (oleate Na, stearates Ca, Zn)	0,2	0,27

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Basic formulations

Gypsum plaster

BASIC COMPOUND	Hand work	Machine		
		Standard	Light	Gypsum and lime
1. Mineral components				
Semihydrated gypsum $CaSO_4 \cdot 0{,}5\ H_2O$	70	75	70	60
Burnt lime $Ca(OH)_2$	5	5	5	15
DIASIL	***3***	***3***	***10***	***6***
Lime flour $CaCO_3$ 40-100 mcm	12	-	7	10
Lime or silica sand 0-0,63 mm	10	18	5	10
Perlite 0 – 1 mm	1		3	
2. Admixtures				
Cellulose ester (high or medium viscosity)	0,12	0,17	0,2	0,12
Porous agent	0,005	0,005	0,02	0,005
Starch ester	0,02	0,03	0,03	0,03
Setting retarder	0,1	0,1	0,1	0,1

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Basic formulations

Filler paste

BASIC COMPOUND	Filler paste for thermal insulation	Cement filler paste - final	Cement filler paste for repair
1. Mineral components			
Portland cement	25	33	30
Burnt lime $Ca(OH)_2$	4	4	4
DIASIL	***2***	***3***	***4,5***
Lime flour $CaCO_3$ 40-100 mcm	7	59,5	8
Silica sand 0,1-0,3 mm	59,6	-	54
2. Admixtures			
Cellulose ester of medium viscosity	0,25	0,25	0,25
Redispersible polymeric powder	3	1,24	1,24
Dispergator	0,01	0,01	0,01
Polypropylene fibers	0,14	-	-

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