
WWW.IIBCC.BIZ
IIBCC
International Inorganic-Bonded Fiber Composite Conference
19-22
NOV 2024
SUPPLIERS' DAY
CONFERENCE
SITE VISIT
GALLE FACE HOTEL, COLOMBO
CONFERENCE THEMES
Raw material technology | Low-carbon and greener binders | New generation of reinforcing fibers | Production process
New market and opportunities for inorganic bonded composites | Building systems, applications and performance
Product characterization | Finishing products and processes | Market trends | Architecture and aesthetics
Durable and more sustainable solutions | Greener and eco-friendly solutions

Elkem

ELKEM MICROSILICA® IN FIBRE CEMENT

Elkem


Elkem
More than 120 years of history as a technology provider
Founded in 1904 by Sam Eyde
Listed on **Oslo stock exchange** since March 2018
27 PLANTS WORLDWIDE
Headquarter in Norway
>400 R&D PEOPLE
R&D centres in Norway, France and China
~6.100 EMPLOYEES
Worldwide
21,4 BNOK
Total operating income

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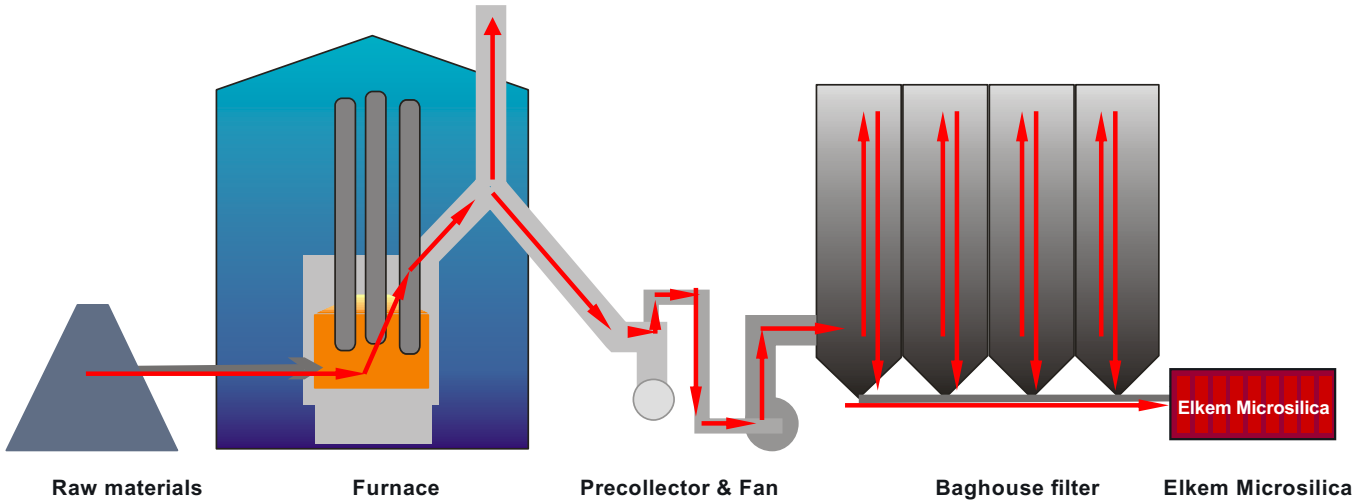
Microsilica - Production

Elkem Microsilica is a co-product of the Silicon and Ferrosilicon smelting process, collected from the smelting gases in specialised filters



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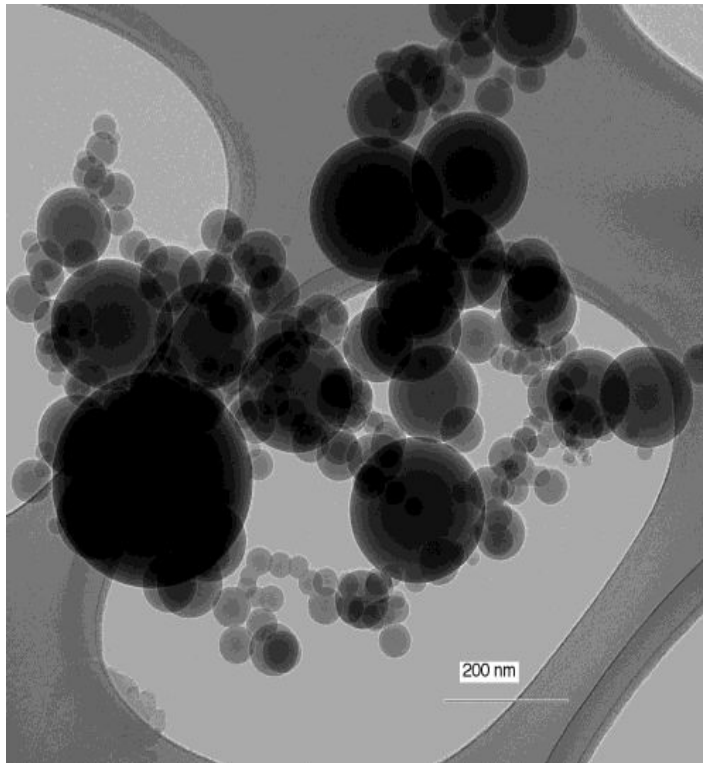
Characteristics of Elkem Microsilica®

- co-product from silicon and ferrosilicon production
- amorphous SiO_2
- spherical particle shape
- average particle size: 0,15 micron
- specific surface area: ≈ 20 m^2/g
- off-white to dark-grey



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Versatile packaging and a global distribution network

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A well proven Technology

Elkem Microsilica is an ultrafine, highly reactive pozzolan

The term “pozzolan” is derived from the ancient Italian town of Pozzuli where volcanic ash was mixed with burnt lime to make cement.

Pozzolans have been used for centuries; even the Classical Greeks and Romans used cements made from volcanic ash that had pozzolanic properties.

The large surface area and the high content of amorphous silicon dioxide gives Elkem Microsilica superior pozzolanic properties.

**Pantheon in Rome (119-128 AD) is an outstanding example of the durability and lasting strength pozzolans will give concrete.*

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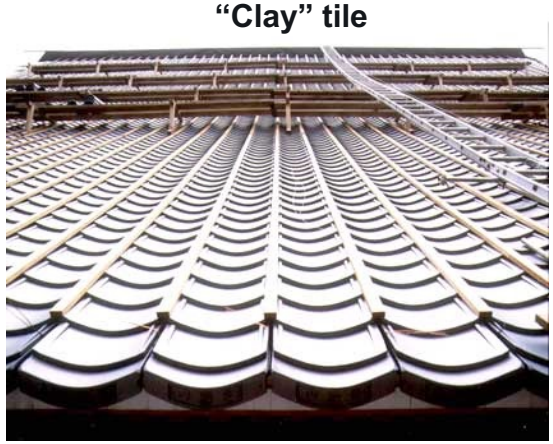
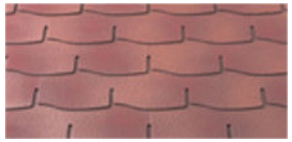
Fibre cement

“Clay” tile



Roof tile





Siding board



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Why is microsilica used in Fibre cement?

- Cellulose and PVA fibres do not perform as well as asbestos fibres. The addition of microsilica to the Cellulose/PVA system restores this performance in air cured sheets.
- Microsilica improves Bending Strength, Freeze-Thaw Properties and Durability in hardened products. It also improves the inter-laminar bonding between the layers in a fibre cement sheet.
- Microsilica improves ‘mouldability’ in fresh fibre cement sheets preventing cracking along corrugations
- Producers offer a 30-year guarantee on their products and microsilica reduces the risk of any long-term problems.

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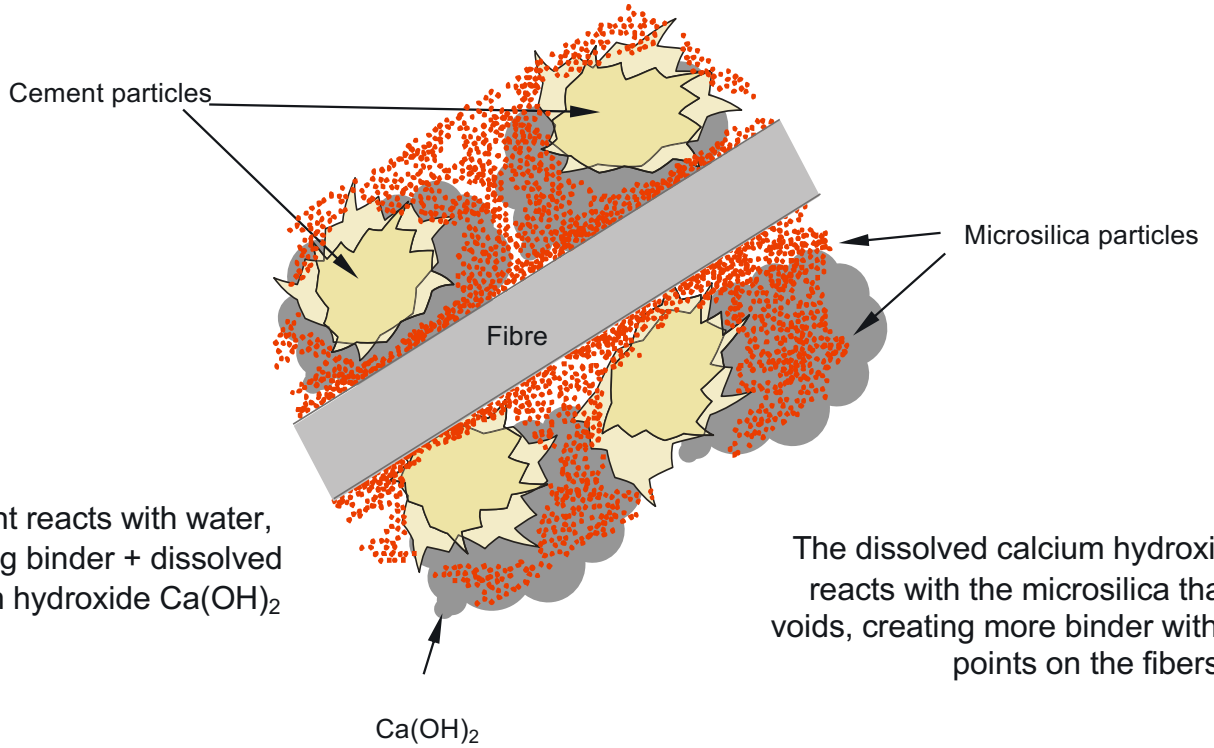
How Elkem Microsilica® works



Cement reacts with water, creating binder + dissolved calcium hydroxide $Ca(OH)_2$

The dissolved calcium hydroxide $Ca(OH)_2$ reacts with the microsilica that fills in the voids, creating more binder with more binding points on the fibers.

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Surface of PVA fibre in a fibre cement product

Photo 1 PVA Fibre surface Without microsilica

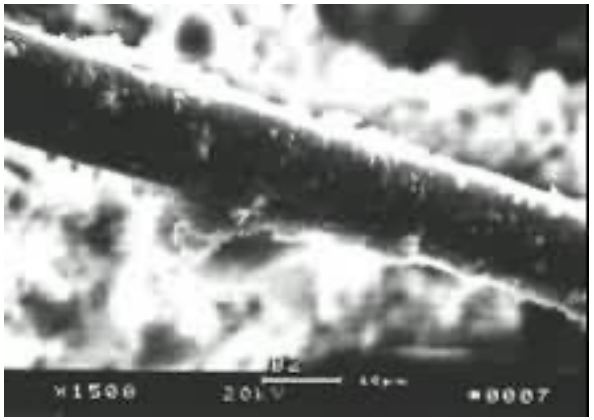

Photo 2 PVA Fibre surface with 4% microsilica

Photo 3 PVA Fibre surface with 8% microsilica

Photo 4 PVA Fibre surface with 12% microsilica

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Microsilica has improved the quality of FIBRE CEMENT products over 30 years.

PRODUCTS BRANDS

Emsac® 500 slurry

Elkem Microsilica® 920 powder

Fibre cement is used in producing:

- Roof tiles
- Corrugated sheets
- Sidings and planks
- Drainage pipes

In Fibre cement the Microsilica improves:

- Strength
- Durability
- Formability
- Laminar bonding

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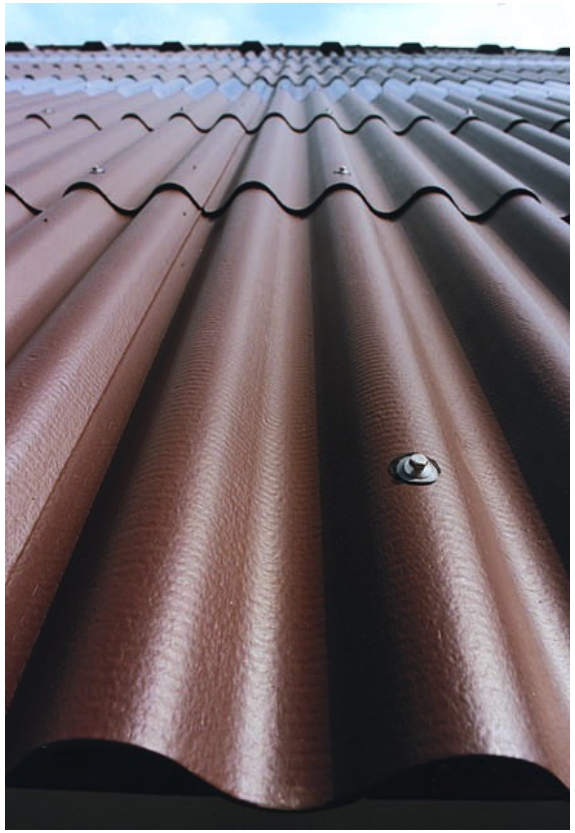
The Advantages of using Elkem Microsilica® in Fibre Cement - PROCESS AID



- **Increased Plasticity**
- **Improved Laminar bonding**

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The Advantages of using Elkem Microsilica® in Fibre Cement - STRENGTH

- **Increase Modulus of Rupture**
- **Increase Density**

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The Advantages of using Elkem Microsilica® in Fibre Cement - DURABILITY

- **Improved Water Resistance**
- **Increased Freeze / Thaw resistance**

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Elkem Silicon Products - Best Total Solution

- **Microsilica of suitable and stable quality**
- **Mix design support based on locally available raw materials (both technical and economic considerations)**
- **Specialised Fibre Cement Technical Centre**
- **Process Technology input**
- **Logistics and handling of MS, including equipment and engineering for on-site MS-slurry production**

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Booth 6

Booth 6

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A Bluestar Company