

fortera  
**ReCarb<sup>®</sup>**  
**Plant**

Redding, CA | USA



**Paving the Way to Zero CO<sub>2</sub> Cement**



ReAct Product Silos

Thermal Polishing

Raw Lime Silo

Clarifier

Agitated Flash Dryer

CO<sub>2</sub> Absorber

Dissolution Reactor

Filter Press

CO<sub>2</sub> from Kiln Exhaust

# ReCarb<sup>®</sup> Plant

Redding, CA | USA | 2024



National Winner 2023

**BloombergNEF Pioneers**  
Finalist 2024 for Challenge 2:  
Decarbonizing the Construction  
Operation of Buildings

**Small Scale**  
Commercial Plant

**ReAct<sup>®</sup>**  
Blend & Cement Product

**Industrial Carbon Mineralization**  
and Multi-Pollutant Utilization Process

## One of the Largest Industrial CO<sub>2</sub> Mineralization Plants in the World

This first-of-its-kind plant executes Fortera's patented ReCarb process technology on a commercial scale, while also providing the building and industrial sectors with a scalable solution to drastically reduce carbon emissions.

Located on CalPortland's campus in Redding, CA, the Fortera Redding ReCarb Plant takes industrial CO<sub>2</sub> from CalPortland's kiln and mineralizes it through Fortera's patented ReCarb process, creating ReAct — the market leader in green cement solution.

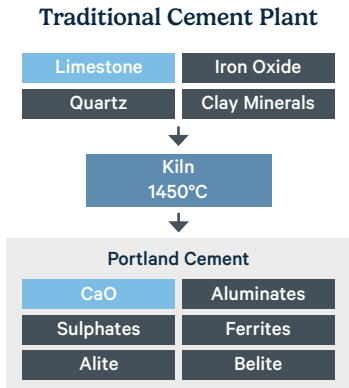
- 15,000 tons**  
per year of ReAct green cement produced.
- 9,600 tons**  
per year of CO<sub>2</sub> savings.
  - 6,600 tons per year directly captured in ReAct product
  - 3,000 tons per year offset from energy savings

“ We've invented a way to manufacture low-carbon cement that is commercialization-ready and able to economically scale globally. ”  
*Ryan Gilliam, PhD, CEO*

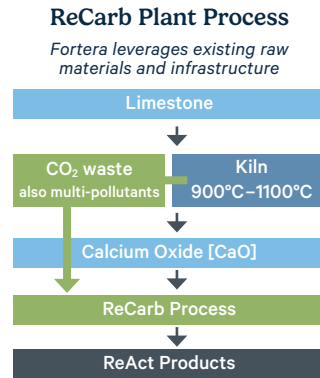
Our focus to work alongside our customers will pave a path to zero CO<sub>2</sub> cement production by upcycling carbon emissions directly from the kiln.

## Traditional Cement Plant vs. ReCarb Plant Process

Inspired by nature, this patented scalable process for making cement uses CO<sub>2</sub> instead of emitting it. We intercept the CO<sub>2</sub> emitted when limestone is heated during calcination, and upcycle it to be used to create low-carbon cement.

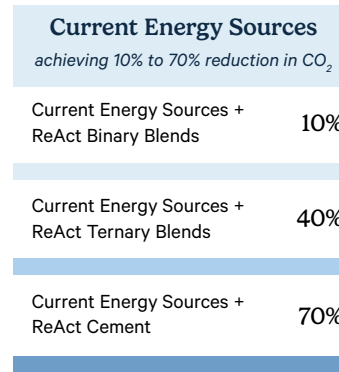


VS

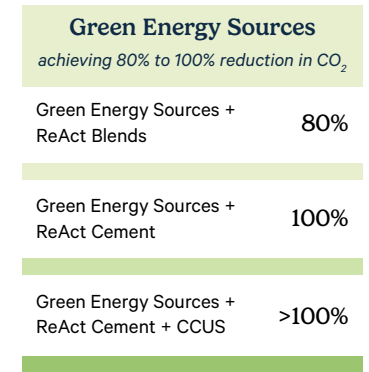


## Paving the Way to Zero CO<sub>2</sub> Cement

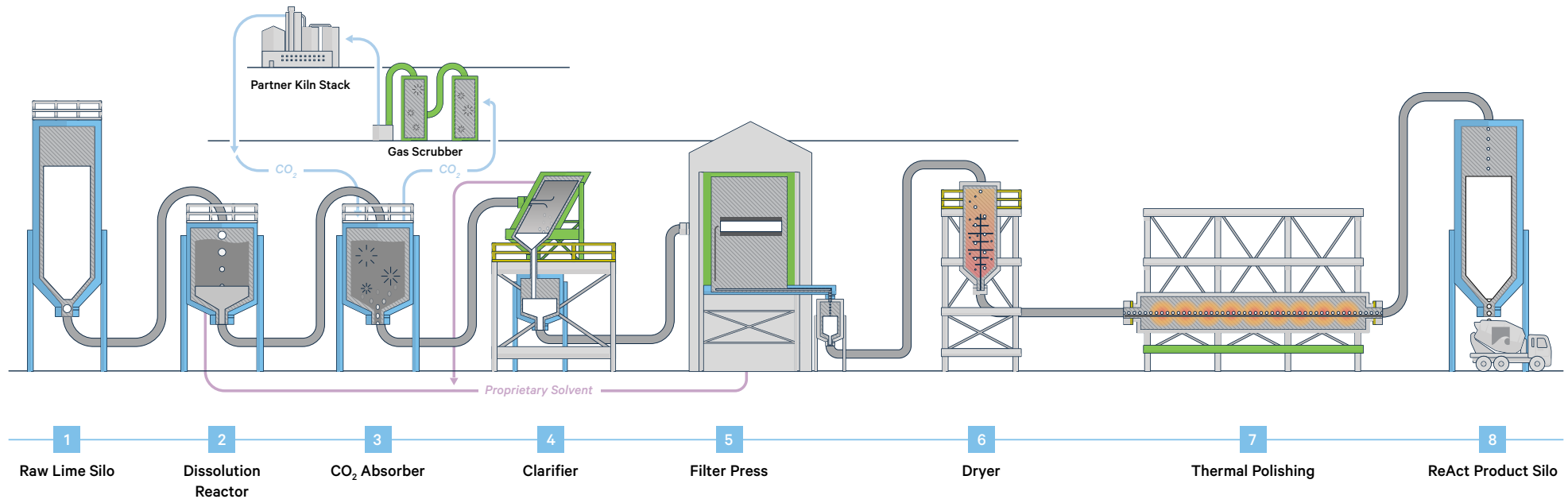
Fortera's patented ReCarb Process generates cement with 70% less CO<sub>2</sub> from its proprietary chemistry, and when combined with green energy becomes a zero CO<sub>2</sub> cement.



VS



## Redding ReCarb Plant Process



Award-winning ReAct is a highly engineered green cement product that is developed through Fortera's patented ReCarb process.

The ReAct product portfolio contains two primary variations: ReAct Blend—engineered to work with cement to improve early strength and flow—and ReAct Cement—a standalone cement replacement.

**ReAct Blend**

The Fortera Redding ReCarb Plant will produce ReAct Blend with a 15% blend to the market. This equates to 10% lower CO<sub>2</sub> emissions per ton of blended cement.



Typical Physical Properties	
BET Surface Area (m <sup>2</sup> /g)	5 – 7
D <sub>10</sub> (μm)	2.5 – 4
D <sub>50</sub> (μm)	5 – 7.5
D <sub>90</sub> (μm)	9 – 12

**Description**

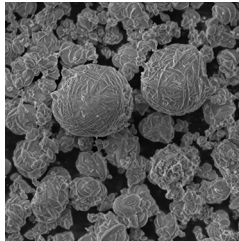
ReAct Blend's fineness and morphology are designed to increase packing efficiency, accelerate cement hydration, and improve workability.

**ASTM**

C150, C595, C1157

**Key Benefits**

- Low Clinker Blend
- Ample Surface Area for Nucleation Effect
- Improved Particle Packing
- Faster Strength Gain
- Strong Reactivity with Alumina



**Applications**



Portland-Limestone Cement



PLC Extender



LC<sup>3</sup> Enabled



Slag Extender



Fly Ash Extender

**ReAct Cement**

ReAct Cement is a white calcium carbonate cement, that is a reactive form of calcium carbonate known as vaterite.



Typical Physical Properties	
BET Surface Area (m <sup>2</sup> /g)	1 – 4
D <sub>10</sub> (μm)	7 – 10
D <sub>50</sub> (μm)	14 – 18
D <sub>90</sub> (μm)	23 – 28

**Description**

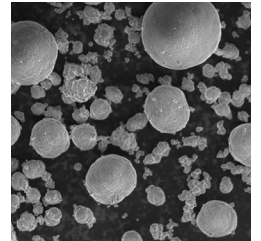
ReAct Cement is a binder based on the transformation of vaterite to aragonite or calcite, which has been successfully utilized to manufacture building materials.

**ASTM**

C330 – LW Aggregate, C1288 – Fiber-Cement Boards, C1157

**Key Benefits**

- High CO<sub>2</sub> Avoidance
- Good Strength to Weight Ratio
- Rapid Curing at Elevated Temperatures
- Dimensionally Stable
- Superior Whiteness



**Applications**



Fiber-Cement Board



Lightweight Aggregate

**2024 SUSTAINABLE PRODUCT OF THE YEAR**

**GREEN BUILDER MEDIA**  
Building a Better World

This editorial team selection represents today's most innovative products that make homes more efficient, resilient, healthy, intelligent, and safe.



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Learn more at  
[www.forteraglobal.com](http://www.forteraglobal.com)

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