

SUSTAINABILITY AND PROFITABILITY

Where CO₂ Means Green and Sustainability Meets Profitability™

Solidia Technologies offers cement and concrete producers a way to manage CO₂ responsibly. Cement producers emit less CO₂ during the production of Solidia Cement™, and concrete producers consume less during the curing of Solidia Concrete™.

Solidia Cement™: Less limestone and lower kiln temperatures translate into less CO₂ and lower cost.

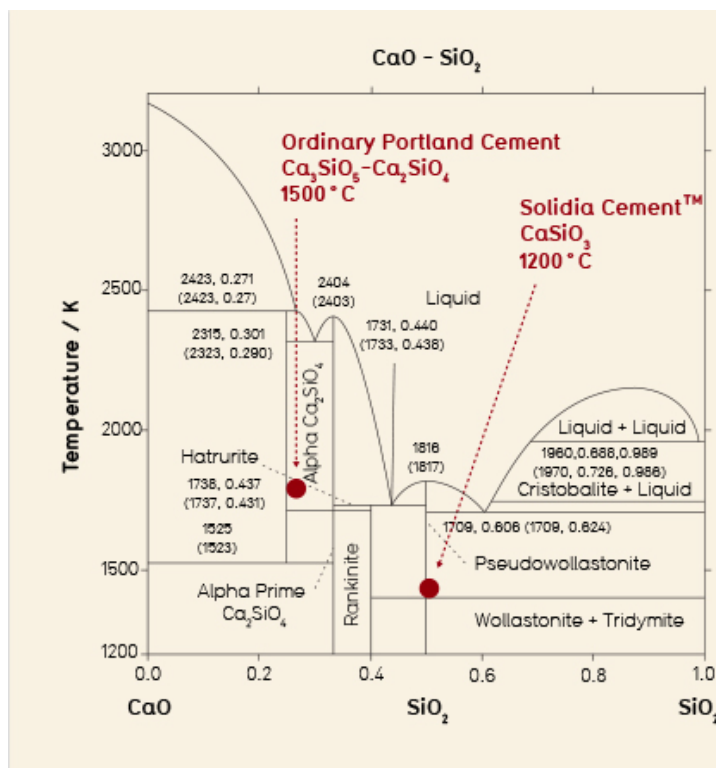
Despite their chemical and process similarities—both are made from mixtures of limestone, clay and sand fired at elevated temperatures in rotary kilns—Solidia Cement and Ordinary Portland Cement (OPC) have distinct profiles, particularly in terms of sustainability and performance. The Portland cement industry is working hard to reduce their environmental footprint. When OPC is produced, it releases about 800 kg of CO₂



Cement Manufacturing Plant

Cement kilns emit over 800 kg of CO₂ per ton of Ordinary Portland Cement (OPC) produced.

for each ton of OPC produced. Approximately three-quarters of the CO₂ is generated from the decomposition of limestone, and the rest from the burning of fossil fuels required to heat the kilns.



LEVERAGING EXISTING CEMENT PLANT ASSETS

	Ordinary Portland Cement	Solidia Cement™
Basic Chemistry	Ca ₃ SiO ₅ - Ca ₂ SiO ₄	CaSiO ₃
Raw Materials		
Wt. % Limestone	-80%	-55%
Wt. Shale/Clay/Sand	-20%	-45%
Max Kiln temp.	1500° C	1200° C
CO₂/t of cement	800 kg	550 kg
Energy /t cement	5.4 GJ	3.8 GJ

By contrast, Solidia Cement’s chemistry requires less limestone and can be fired at lower kiln temperatures. As a result, Solidia Cement can be manufactured while consuming 30% less energy and reducing the emission of greenhouse gases and other pollutants by up to 30% when compared to OPC.

Solidia Concrete™: Sequesters approximately 5% of its weight in CO₂ during curing

Solidia Concrete and OPC concrete are both composed of sand and aggregate, bonded together by a cement paste that hardens during a curing process. But while conventional concrete cures by a reaction between OPC and water, Solidia Concrete cures through the sequestration of CO₂. During curing, Solidia Concrete sequesters approximately 5% of its weight in CO₂.

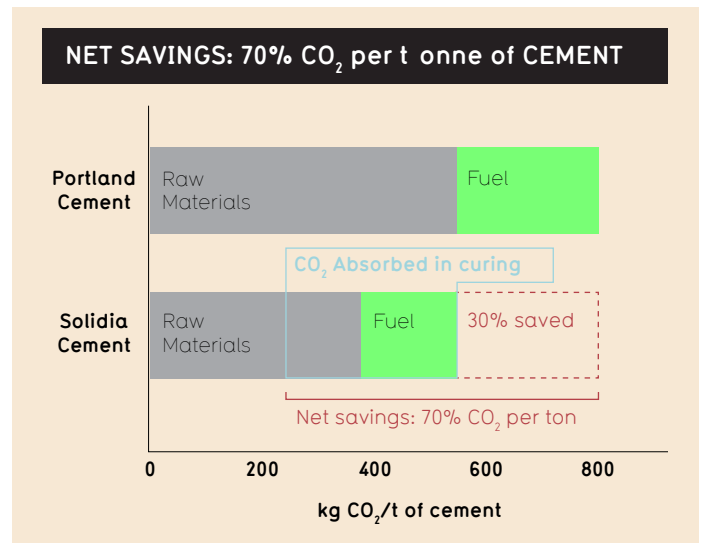
The resulting product is a versatile and durable replacement for conventional concrete.

Solidia Concrete cures only when it is exposed to a CO₂ -containing environment. This unique characteristic allows precise control of the curing process, permits the incorporation of a broad range of sands, aggregates (including those that cannot be used by the traditional concrete industry) and reinforcements, and enables concrete manufacturers to operate at higher speeds while minimizing material waste. Solidia Concrete parts can be designed for compressive strength, abrasion resistance, and freeze-thaw cycling resilience that are equal to, or better than, those of conventional concrete.

Solidia Cement and Solidia Concrete:

When the reduced CO₂ emissions associated with Solidia Cement production are coupled with the ability of Solidia Concrete to sequester CO₂ during curing, the carbon footprint of the concrete products can be reduced by approximately 70%.

Solidia makes all this possible by leveraging the cement and concrete industries’ existing capital



investments and supply and value chains. It will make the adoption of its technology easy and cost-competitive by lining up cement, CO₂ and equipment partners to collaborate with our customers along each step of the process.

When the reduced fuel costs associated with Solidia Cement production are considered alongside the raw materials, process and performance advantages, and ease of adoption offered by Solidia Cement and Solidia Concrete, both the cement and concrete industries may indeed envision a future where sustainability meets profitability.