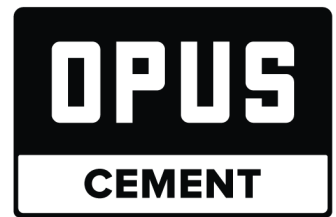


# Terra introduces OPUS: A road map to eco-friendly concrete



**OPUS will reduce emissions in the USA. Every ton of OPUS Reagent replacing a ton of Portland cement, drives a 70% reduction in CO<sub>2</sub> & a 90% reduction in NOx emissions.**

Terra's OPUS Reagent is an engineered cementitious material with a significantly lower carbon footprint than Portland cement. Only 0.283 tons of CO<sub>2</sub> is emitted for manufacturing a ton of OPUS Reagent compared to 0.922 tons of CO<sub>2</sub> per ton of Portland cement, driving a 70% reduction in CO<sub>2</sub>. In addition, NOx emissions will be controlled, not to exceed 0.16 lbs/ton, while at a typical Portland cement plant NOx emissions range from 0.9 to over 3.0 lbs/ton.

Developed from plentiful & readily available silicate rocks, the OPUS Reagent is the foundation of both our products:



**OPUS SCM™** - An easy and established way to improve the environmental performance of concrete is to replace 10-25% of the cement content with a low-CO<sub>2</sub> Supplementary Cementitious Material (SCM). OPUS SCM™'s sole ingredient is Terra's OPUS Reagent and is a direct replacement for Portland cement.

With appropriate mix design including admixtures, higher replacement, i.e. up to 40%, is possible without any compromise in properties and the mixes can be made cost competitive.



**OPUS ZERO™** - OPUS Zero is our future 100% replacement for Portland Cement. A game changer in concrete decarbonization! OPUS ZERO™ is an advanced cement with zero clinker content and zero carbon emissions when using renewable energy and non-carbonate raw materials. OPUS ZERO™ is currently undergoing concrete trials and is expected to be available in 2025.

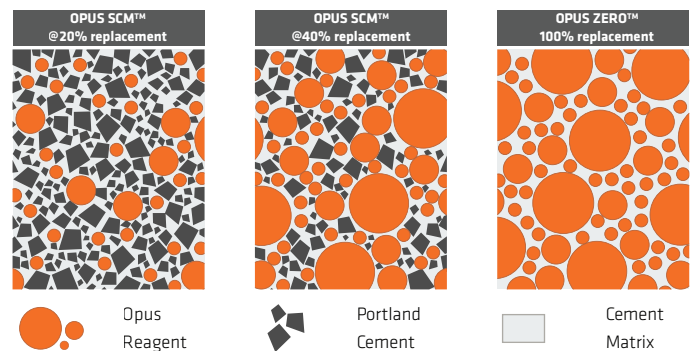
## The OPUS impact for the USA further quantified

Market Share	CO <sub>2</sub> emission savings (metric tons per year)		
	OPUS SCM™ (@20%)	OPUS SCM™ (@40%)	OPUS ZERO™
10%	1,137,420	2,274,840	4,505,607
25%	2,843,550	5,687,100	11,264,018
50%	5,687,100	11,374,200	22,528,036
80%	9,099,360	18,198,720	36,044,858

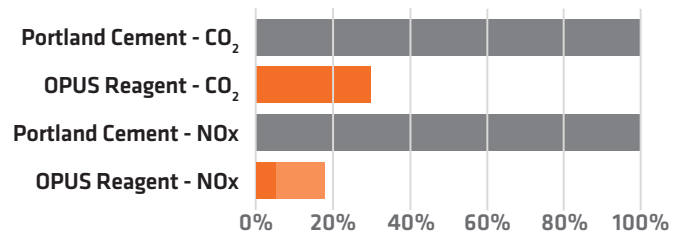
Using the **50% uptake** of OPUS ZERO™ as reference case, the annual 22,528,036 metric tons of avoided CO<sub>2</sub> emissions equate to:

- taking 4,897,399 cars off the road
- the annual residential energy use of 7,960,437 people
- decreasing the USA's cement emissions by 27%

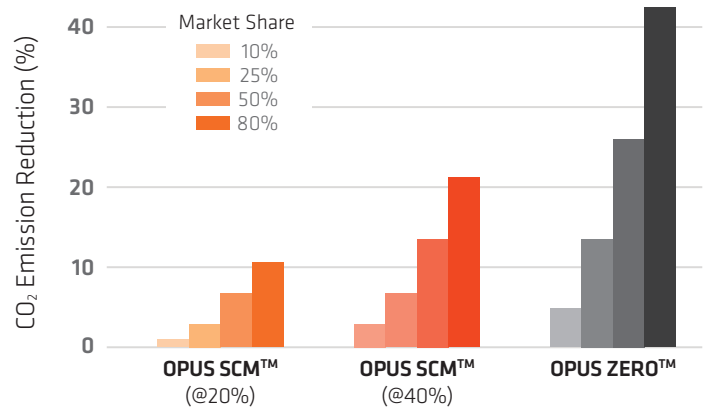
## Reducing Portland cement content with OPUS



## The OPUS Reagent: low CO<sub>2</sub> & NOx emissions



## OPUS product adoption & CO<sub>2</sub> reduction



The USA's cement CO<sub>2</sub> emissions can be significantly reduced with the help of the OPUS product suite in the transition away from high Portland cement usage.



For additional information, please contact us:

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