

Environmentally friendly concrete

Headquartered in Somerville, Mass., just north of Boston, Sublime Systems is working to remove carbon emissions from the concrete-making process. In addition to water, sand, and aggregate, traditional concrete mixes require Portland cement, an expensive and energy-intensive product projected to reach 5.8 billion tons in global CO₂e emissions by 2027. Nearly half of those emissions come from burning coal and other fossil fuels to heat a kiln up to 1500°C, and the other half from the chemical decomposition of limestone inside the kiln.

Sublime Systems cancels out both emissions sources. The pro-

cess starts with calcium silicates, or noncarbonate feedstocks made from abundant rocks and minerals, as well as recycled industrial waste like fly ash and blast-furnace slag. Unlike limestone, there is no CO₂ bonded to these materials, yet they still contain the key ingredients needed to make cement. Sublime's electrolyzer (electrochemical reactor) burns no fossil fuels and requires temperatures only up to 100°C to achieve the necessary chemical reaction. An independent life-cycle assessment also confirmed that this process eliminates more than 90% of the global warming potential compared to Portland cement.



Low-carbon concrete, coming soon. Using feedstock free of carbonates and a low-temperature kiln, Sublime Systems is making concrete with 90% less global warming potential.

Sublime currently has a pilot electrochemical cement manufacturing facility capable of producing 250 metric tons of cement per year, but is in the process of developing a commercial plant in Holyoke, Mass., capable of producing a low-carbon cement by the kiloton. The plant itself will occupy a series of former paper mills and run on the river's hydro-

power, which the company has cited as critical infrastructure for its fully electrified manufacturing process. Earlier this year, Sublime was awarded \$87 million from the U.S. Department of Energy to ramp up production and create training programs for local labor. This is all coming soon—the Holyoke facility is expected to come online in 2026.

Justin Wolf, a Maine-based writer who covers energy and climate policy and green building trends

Indoor-safe screed

Ditching an extension cord is nice, but there are even more benefits to replacing gas motors with batteries. These benefits are why I invested in the new Milwaukee power screed. This motor-free tool requires less maintenance, and I don't have to worry about old or bad gas gumming up the carburetor or the noise of a roaring engine. And to me, the absence of harmful fumes, and being able to work inside without the risk of carbon monoxide poisoning, is always a good thing.

Milwaukee makes screed bars from 4 ft. to 16 ft long. I have the 8-ft. and 12-ft. bars. I like the “clamp-on” bar design because it allows you to swap out bars fast, and you don't need to totally remove (and potentially lose) nuts and bolts. I like that when I need to pause while using the tool, there is a handy kickstand to keep the tool out of the mud. The manufacturer says that the 3-Ah lithium battery will run the 12-ft. screed for two hours per charge, which seems about right. The Milwaukee MXF381-2CP screed kit includes two batteries and a charger, and comes with a two-year battery and a two-year equipment warranty, which is nice to have for more expensive tools like this. I purchased mine for \$2500. The bars are sold separately and start around \$300.

Aj Reyer, a concrete contractor in Rosemount, Minn.



Gas-free screed. A 72v, 3-Ah battery powers Milwaukee's vibrating power screed for two hours when using a 12-ft. screed.