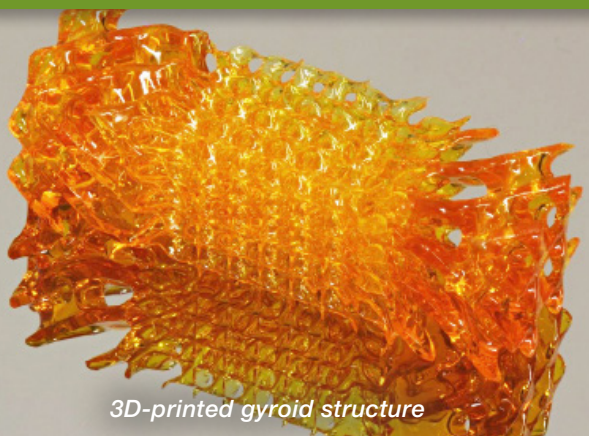
Advanced Manufacturing to Drive Down Capture Costs

Improving Performance Through Additive Manufacturing

Additive manufacturing, using 3D printing, enables the development of components for carbon capture equipment that intensify heat and mass transfer, improve process performance, and reduce overall equipment size, lowering capital and operating costs.

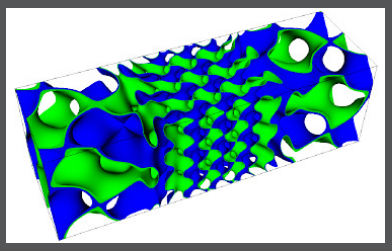


3D-printed gyroid structure

DOE/FE/NETL is currently supporting three projects that are using 3D printing to produce rapid prototypes with the potential to capture CO_2 more efficiently and economically.

Lawrence Livermore National Laboratory

Designing and fabricating high-efficiency reactors using novel geometries that support transformational solvent-based capture technologies.

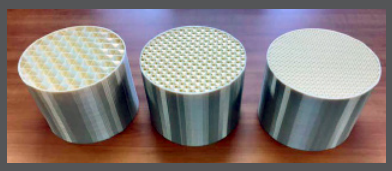


ION ENGINEERING

Developing a 3D-printed absorber with integrated packing and internal cooling capabilities to help optimize solvent-based capture.

Oak Ridge National Laboratory

Producing intensified devices that combine heat and mass transfer operations to drive down costs of solvent-based capture processes.



Progress to Date

Silicon-based gyroid structures have been created with one micron resolution using stereo-lithography.

Both plastic and metal absorbers have been 3D-printed for testing and analysis.

An aluminum version of a column packing structure with built-in heat exchange has been successfully 3D-printed.

U.S. DEPARTMENT OF ENERGY | NATIONAL ENERGY TECHNOLOGY LABORATORY

https://www.netl.doe.gov/research/coal/carbon-capture

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AUGUST 2019