CO₂-SUICOM×3DP =3DP for Carbon Neutral

Carbon-neutral 3D concrete printing
Constructing objects by layering CO₂-SUICOM carbon-capturing concrete

Carbon-neutral 3D printing involves pouring out layer after layer of cementitious materials to create concrete parts and structures. The technology allows us to easily tackle projects that were difficult in the past—for example, structures with intricate designs or structures that require the application of structural mechanics. Additionally, by using CO₂-SUICOM, a carbon-capturing concrete, we can significantly lower the carbon footprint of our 3D printing process.

* The technology was developed based on joint research with Kanazawa Institute of Technology

Description

- To resolve productivity issues in construction, the industry has begun using digital tools in measurements and surveys, designing, and maintenance and management. However, construction remains a manual process—one reason why productivity has not significantly increased.
- With 3D printing, machines can construct objects based entirely on digital data. By incorporating this technology, we can digitalize the entire concrete construction process—from measurements and surveys to maintenance and management—and greatly increase productivity.

| Measurements and Surveys		Designing		Construction		Maintenance and Management
3D surveying	▶	3D modeling	▶	Manual process	▶	Computer-based monitoring / Remote interaction via 3D models

Features

- Cement mortar is poured out in layers to reproduce digital objects, removing the need for molds.
- Using robot arms allows us to achieve complex shapes and forms that cannot be achieved with standard formwork-based construction.
  As the objects are automatically constructed based on digital data, we can complete projects with much smaller teams.
- The technology makes it easier to construct parts with hollow areas, giving the parts larger surface areas. This allows our CO₂-SUICOM carbon-capturing concrete to capture CO₂ more efficiently and harden quickly, which in turn can help cut production costs.

Robot arm-based 3D printing   An example of mortar layering status
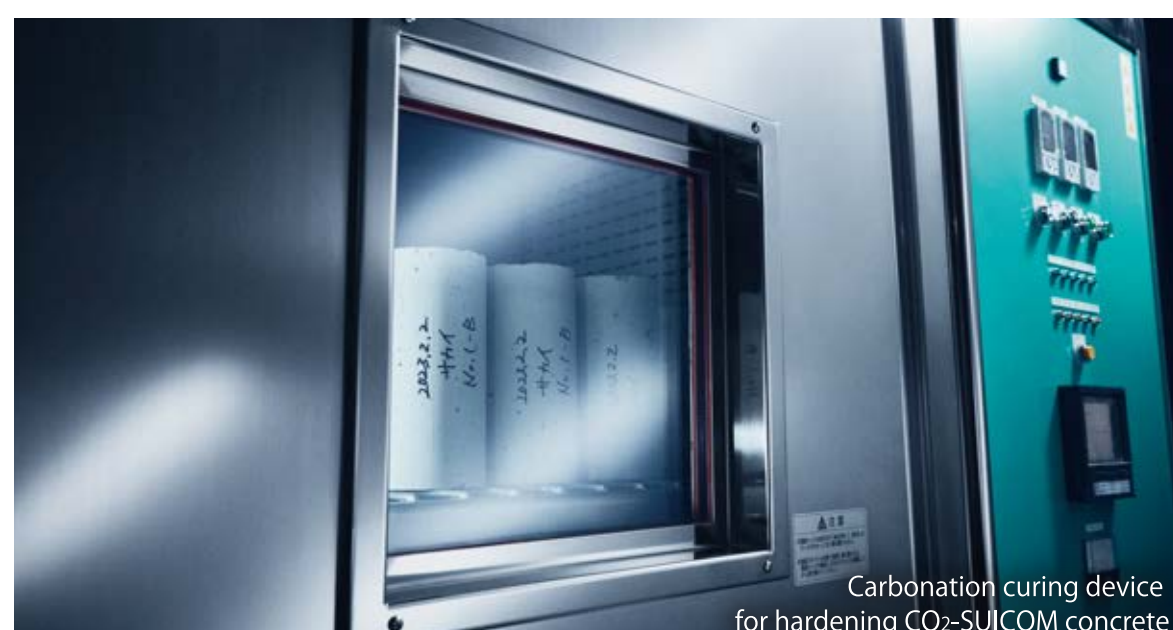
Carbonation curing device
for hardening CO₂-SUICOM concrete

Examples