

# **C<sup>4</sup>S Research and Development Project**

## **II. Technical developments and launch of a pilot plant for producing “Raw materials of CCC”**

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Implementing organizations : The University of Tokyo, Hokkaido University

## II. Technical developments and launch of a pilot plant for producing “Raw materials of CCC”

### Goals toward 2029

- Developing techniques for optimum particle size distribution and accelerated carbonation of raw material for CCC
- Launching a pilot plant producing raw material for CCC with a production speed of 1 ton / day in establishing a feasible control

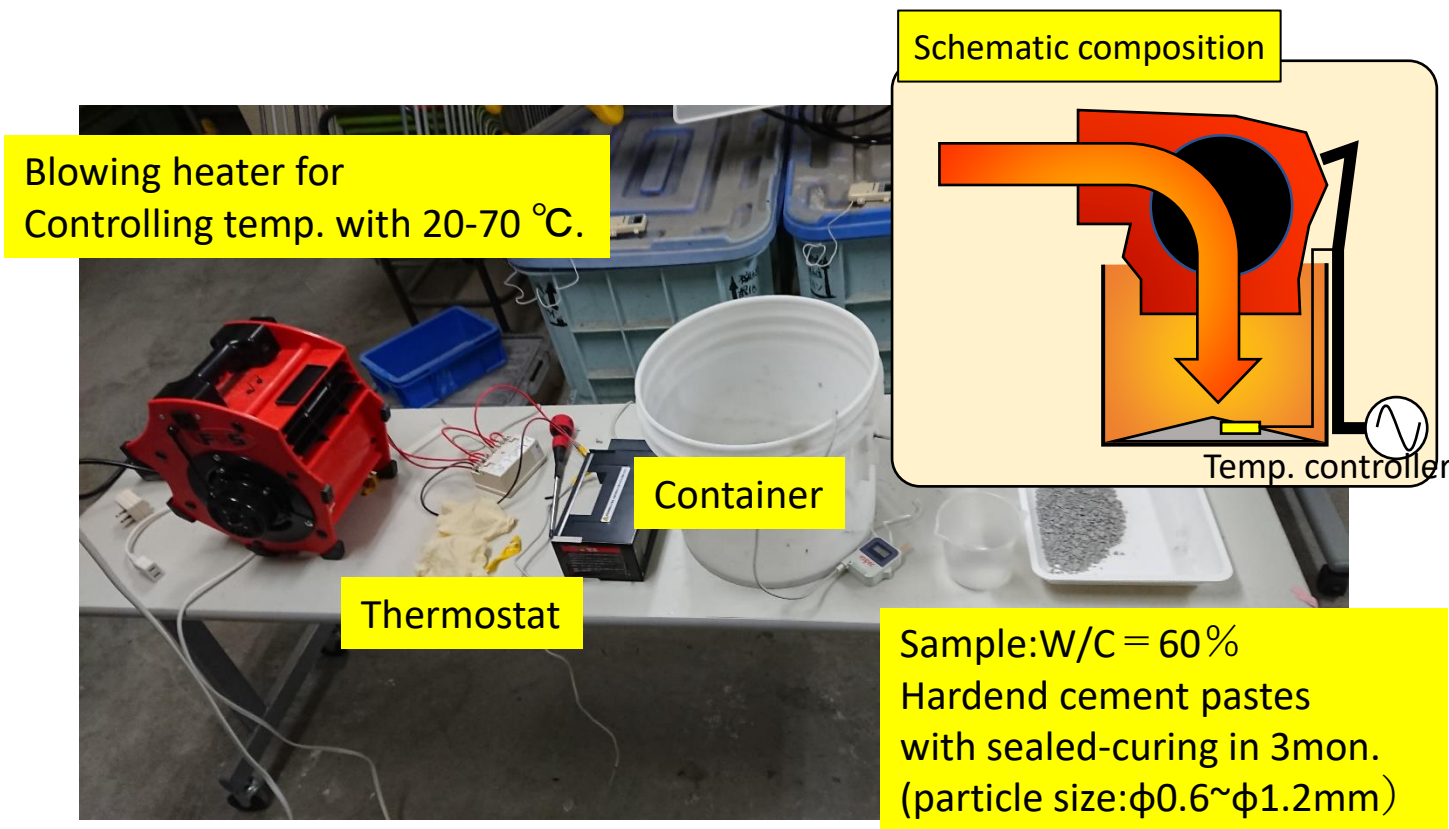
### Development issues

- ✓ Crushing techniques for raw material for CCC
- ✓ Controlling techniques for particle size distribution of raw material for CCC
- ✓ Launch a pilot plant for raw material for CCC

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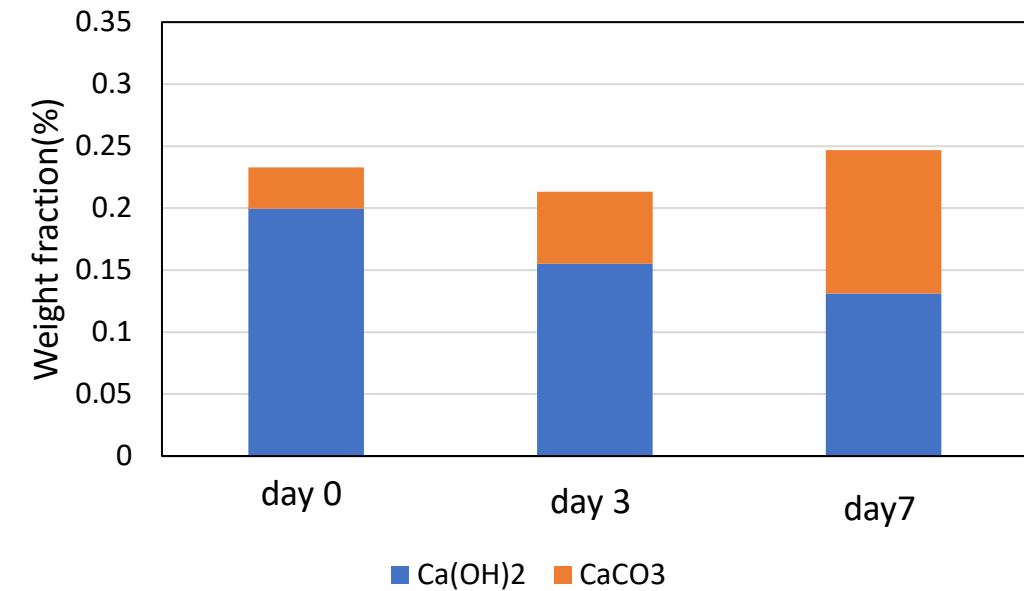
## Current achievements

Experimental device for accelerated carbonation to raw material for CCC using DAC method (ver.4.5)

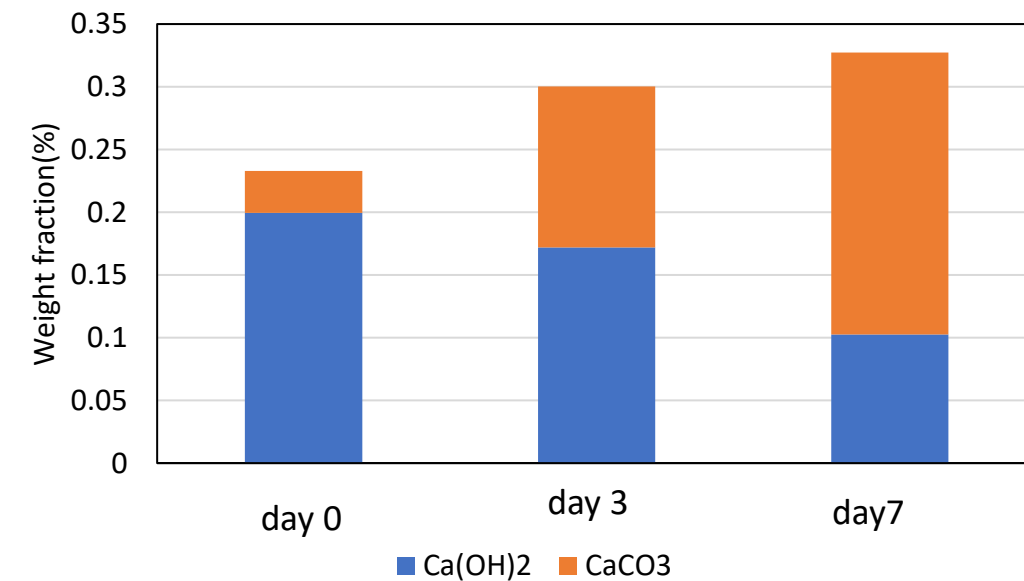


Sample:W/C = 60%  
Hardend cement pastes with sealed-curing in 3mon.  
(particle size:φ0.6~φ1.2mm)

CO2 uptake under 20°C RH60% with non-blowing



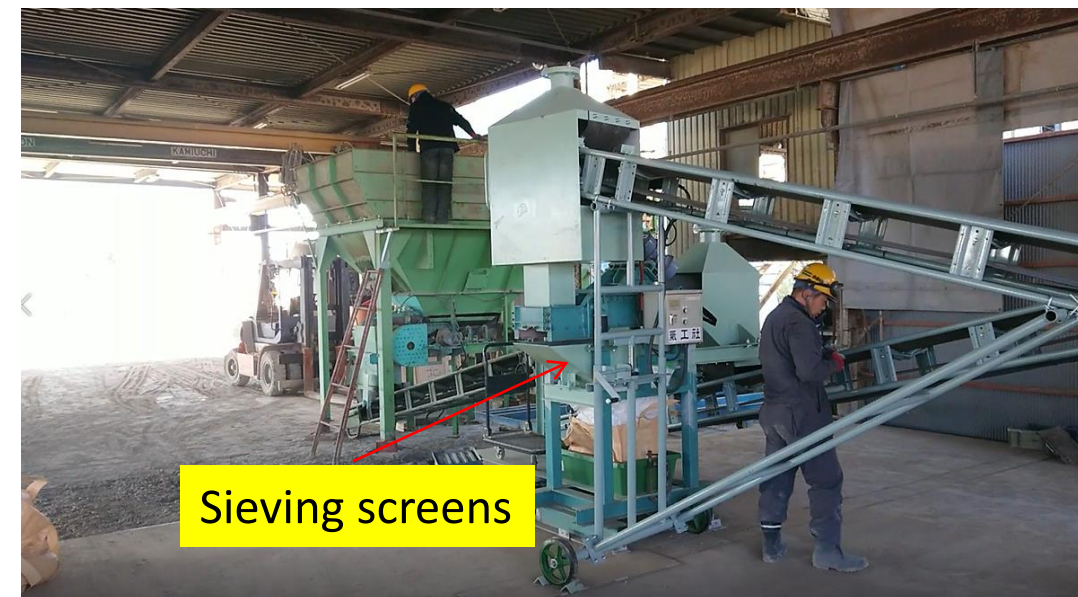
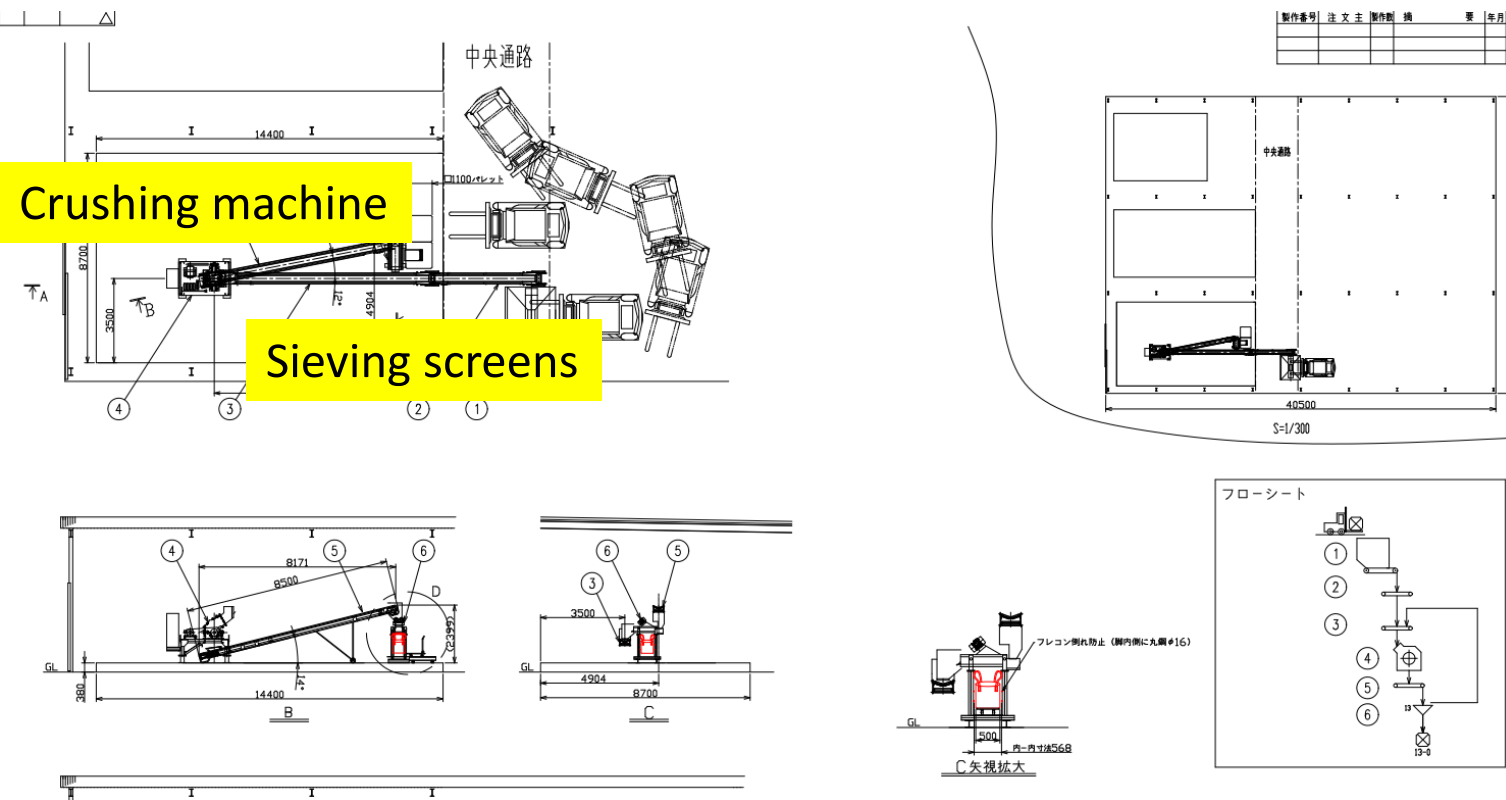
CO2 uptake under 20°C RH60% with blowing



CO2 uptake to concrete become improved by DAC method with 20°C blowing

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- Launching a pilot plant and starting preliminary operation for making raw material for CCC
- Controlling particle size distribution is going well. (Photos at Tochigi factory of Masuo recycle ltd.)



Now we are preparing for an experimental operation to be held in Jan.mid., for crushing and sieving concrete wastes to produce actual raw material for CCC

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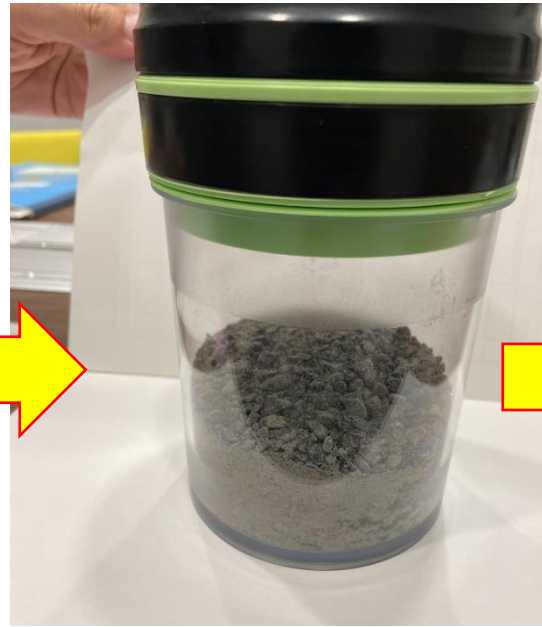
Start to monitor “CO2 uptake” of concrete wastes at actual concrete waste facility



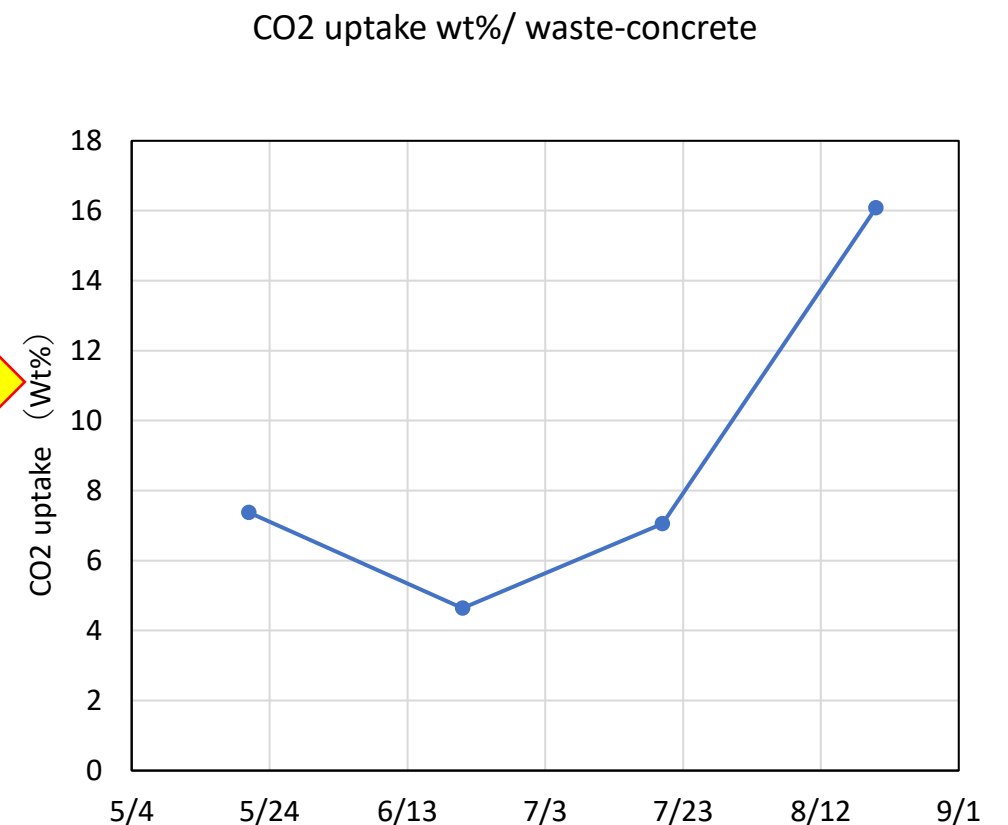
(1) for monitoring, apprx.30kg concrete waste crushed to under 5mm are prepared once a month



(2) Sampling a small amount(100g) for TG-DTA in using sample divider for crushed sand by trained staffs (based on MLIT’s research)



(3) Transporting the sample in vacuum container to analysis institute and evaluating CO2 uptake with TG-DTA



(4) Now we are accumulating results of CO2 uptake of concrete waste in a concrete waste facility and making a database for half a year by trained staffs

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### Conclusion

- Improvement of CO<sub>2</sub> uptake to concrete waste by air-blowing  
→ for a next step, we are preparing an additional approach for further improvement of CO<sub>2</sub> uptake with air blowing
- Continuous investigation for Controlling particle size distribution of raw material for CCC

