

# Developing Business in Southeast Asia and China Leveraging Our Cement Technology to Contribute to a Stable Food Supply and Preservation of the Water Environment

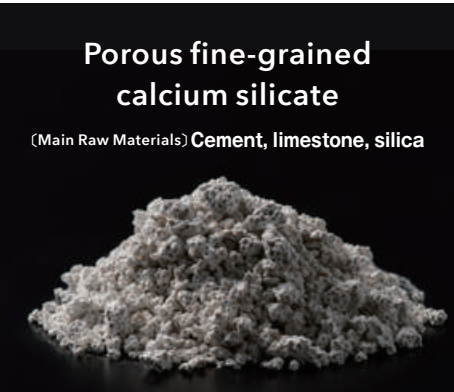
While engaged in the stable supply of cement as a basic material for infrastructure, the Taiheiyo Cement Group has broadened its scope of business by developing products that capitalize on its cement technology. This project, which started with the water treatment business, has evolved into the development of overseas markets and new products while also improving our domestic aquaculture technology. Moreover, it has rapidly grown into a business that contributes to a stable food supply and preservation of the water environment in Southeast Asia and China.



## Products Derived from Cement Technology for Diverse Applications

We are cultivating markets in the aquaculture, agriculture and livestock sectors for our products that contribute to solving food and environmental problems by capitalizing on technologies we have verified in the water treatment sector. These products help preserve the water environment, recover the purifying capacity of

nature, and ultimately contribute to ensuring a stable food supply while creating a sustainable society. They have been sold in Japan and overseas through our Group companies. In our overseas operations we started production in Thailand in 2018 and Indonesia in 2019. We also conducted demonstration tests for the products and launched them in Southeast Asia and China.

Applications	Product Name	Raw Material	Characteristics
Aquaculture	Japan Ceraclean	<p><b>Porous fine-grained calcium silicate</b></p> <p>(Main Raw Materials) Cement, limestone, silica</p> 	<ul style="list-style-type: none"> <li>•Release of silicates and calcium</li> <li>•Phosphorus absorption capacity</li> <li>•Ammonia adsorption capacity</li> <li>•Oxygenating</li> <li>•Alkaline</li> <li>•High water absorption capacity</li> <li>•Bacteria-supported</li> </ul>
	Overseas Ceraclean		
Agriculture	Japan Inenica <sup>*1</sup>		
	Overseas SILICANITE		
Livestock	Japan Escariu <sup>*2</sup>		
	Overseas Healthy bed		

\*1 Inenica is a trademark of Clion Co., Ltd., who developed and distribute this product.  
\*2 Escariu is a trademark of Clion Co., Ltd., who developed and distribute this product.  
Onoda Chemical Industry Co., Ltd. and some other companies are also distributor of this product.

## VOICE Establishing a Business Scheme to Address Social Problems

I am from Thailand and have always had a strong interest in food supply and environmental issues in Southeast Asian countries. Therefore, I am very grateful to have been a part of this project in Japan and to expand the introduction of Ceraclean to Thailand in 2018 and Indonesia in 2019.

A three-year business viability study started in 2016 with support from the Ministry of the Environment, and the Ministry of Economy, Trade and Industry has proved

the feasibility of Ceraclean's production system because of the easy procurement of raw materials and high potential demand for the product, which has led us to expand the market in Southeast Asia. I would like to contribute to solving food and environmental problems in Southeast Asia and China through the provision of Ceraclean and by building up our business scheme as soon as possible.

Environmental Business  
Development Department  
**Nutchaya Kaewrassamee**



## Aquaculture



### Stabilizing Water Quality with Ceraclean and Improving the Productivity of Shrimp Aquaculture

#### Water Quality Stabilizer "Ceraclean" for Aquaculture

The aquaculture industry is drawing worldwide attention as a stable source of fishery resources since global consumption of seafood is increasing with the changes in food habits due to advances in the internationalization of food distribution and economic growth. The production of shrimp and similar resources is rising due to the high feed conversion ratio (FCR) of 1 to 1.5. On the other hand, in China, the world's largest shrimp producer and consumer, the construction of new

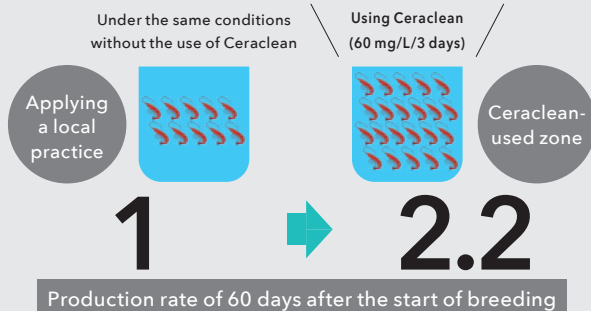


Sorting and preparing to ship shrimp at an aquaculture farm in Surat Thani province (Thailand)

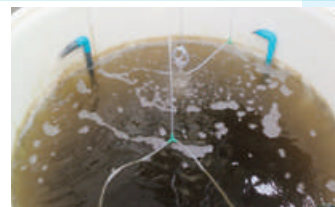
aquaculture ponds is restricted due to the impact on the water environment. And in Southeast Asia, the production volume of shrimp is falling as a result of the degradation of water quality caused by excessively high-density aquaculture.

Verifying the impact of Ceraclean on aquaculture, in a partnership with Tokyo University of Marine Science

### Effects of the Use of Ceraclean (Laboratory Test)



Applying a local practice



Using Ceraclean

and Technology and Walailak University (Thailand), we confirmed that it improved the shrimp survival rate. It is thought that stable water quality and the increase of phytoplankton that is non-toxic and serves as shrimp food are attributable to the absorption of phosphorus and release of silicic acid, which are characteristic features of Ceraclean. It is already being used at shrimp farms in Taiwan, Thailand and Vietnam.

## Marketing Products with a Focus on Water Purification



### Environmental Improvement of Mudflats and Lakes

Product used: Ceraclean

A healthy mudflat is restored by applying Ceraclean to the bottom sediment, where there are fewer fish and shellfish due to deterioration of the water environment in relation to that sediment. In FY2018 the effect of this technology on improving that mudflat environment was confirmed by the Environmental Technology Verification (ETV) Program, sponsored by the Ministry of the Environment.

Obtained ETV mark certification



### Improving the Landscape of a Golf Course Pond

Product used: Ceraclean Golf

Spraying Ceraclean Golf in an artificial pond at a golf course in an enclosed environment can fix the level of phosphorus in the water and curb the accumulation of sludge as well as the growth of blue-green algae, which releases odor. The use of the product made it easy to manage the pond of a golf course, around which the beautiful landscape is valued highly.

### Water Purification at a Carp Farm

Product used: 恋水 こいみず (Koimizu)

Koimizu prevents the accumulation of residual feed and excrement, keeps the water clear and suppresses both odor and a decrease in food intake. It is already widely used in Japanese carp (Cyprinus carpio) production areas such as Niigata, Hiroshima and Okayama Prefectures. The product is highly valued because it makes easier the breeding of carp and control of water quality.

## Agriculture



### Increasing Rice Production Capacity in Southeast Asia

#### Siliceous Fertilizer "SILICANITE"

SILICANITE releases silicic acid in the soil. As rice absorbs silicic acid, it generates silicified cells, which strengthen the plant. These characteristics give resistance to rice against pests, diseases, heat and strong winds, thereby contributing to a higher yield of high-quality rice. Major demand for the product is expected in Southeast Asia, where rice production is seriously affected by rice blast. We selected Vietnam, Malaysia and Indonesia for the promotion of a wider use of the product, and we are presenting it to the relevant ministries and agencies in those countries while applying for its registration as a fertilizer. Major demand for the product is expected in Southeast Asia, where rice production is seriously affected by rice blast. We selected Vietnam, Malaysia and Indonesia for the promotion of a wider use of the product, and we are presenting it to the relevant ministries and agencies in those countries while applying for its registration as a fertilizer.



Field test of rice

## Livestock



### Keeping Livestock Healthy by Improving Their Bedding Environment

#### "Healthy bed" Sanitary Material for Dairy Farms

Demand for dairy products has recently been growing in Southeast Asian countries along with the development of their economies. The low productivity of raw milk requires the region to import it from Australia and other countries. Improving productivity will require reducing cow stress and preventing the occurrence of mastitis, which in turn depends on sanitary breeding conditions. The use of Healthy bed enables dairy farmers to maintain dry, low-alkaline bedding while suppressing the growth of pathogens and ammonia odor. Given that demand for raw milk is expected to grow in Southeast Asia and China, we will conduct local demonstration tests of the product toward quickly achieving commercialization.



The use of Healthy bed in a cattle shed