Realizing a Cleaner Environment by Producing Cement

Unique Cement Plant Features that Contribute to Addressing Environmental Issues

Dalian is a major port city in northeastern China. The city has recently been experiencing dramatic growth driven by the petrochemical, equipment manufacturing, electronics and information industries. Dalian Onoda Cement Co., Ltd. recycles waste and by-products generated in Dalian City as raw materials and fuels for cement toward addressing environmental concerns associated with economic growth.

Concern over environmental impact is growing significantly in China as a result of industrialization, urbanization and rising wealth. For example, oxidized and particulate substances generated by the burning of fossil fuels such as coal generate air pollutants such as PM2.5. Overcoming the challenge of pollution and treating waste and by-products are becoming increasingly urgent issues for Dalian City.

Dalian Onoda Cement Co., Ltd. addresses these issues by recycling various wastes and by-products as raw materials and fuels for cement. The use of waste and by-products per unit production increased almost four times from 102 kg/t-cement in fiscal 2001 to 407 kg/t-cement in fiscal 2013. This means the company recycled 407 kg of waste and by-products in producing each tonne of cement and essentially serves as a kind of resource recycling (waste treatment) plant for local communities.

Through its collaborations with local communities and production processes, Dalian Onoda Cement is playing a role in realizing a cleaner environment as a producer of cement.

Preventing the Emission of Pollutants into the Air

The burning of coal generates hazardous sulfur dioxide (SOx). We therefore desulfurize gas emissions to prevent air pollution, a process that produces a significant amount of gypsum (desulfurization gypsum) as a by-product. Gypsum is used in the production of cement to control the rate of cement hardening. At Dalian Onoda Cement we use desulfurization gypsum recovered from coal-fired power plants in place of natural gypsum for cement production. In fiscal 2013 we recycled 100% of desulfurization gypsum which represented the removal of approximately 26,000 tonnes of SOx from coal-fired power plants. This system not only reduces the consumption of natural resources but removes air pollutants as well.

![Office building of Dalian Onoda Cement Co., Ltd.](image)

The amount of SOx removed is shown in the graph below. Calculated by converting the amount of sulfur contained in used desulfurization gypsum into the equivalent amount of SOx.

![Graph showing amount of SOx removed](image)

Calculated by converting the amount of sulfur contained in used desulfurization gypsum into the equivalent amount of SOx.
Producing Urban Gas and Cement from Sewage Sludge

DaLian Dong Tai Organic Discard Processing Co., Ltd. handles the treatment of sewage sludge in Dalian City. The company recovers methane gas generated by the organic decomposition of sewage sludge for reuse as urban gas. The digested sludge produced by the treatment is also recycled for fertilizer. In September 2013, Dalian Onoda Cement in collaboration with DaLian Dong Tai Organic Discard Processing Co., Ltd. launched a zero-emission project through which we receive digested sludge generated in the Jinzhou District of northern Dalian City for use as raw material and fuel for cement. By March 2014 we had recycled 11,000 tonnes of digested sludge.

We contribute to reducing air pollution from the burning of coal by recycling sewage sludge that had been landfilled as waste in conventional treatment systems for reuse in the production of clean energy in place of coal. Through these efforts Dalian Onoda Cement plays its part in this region’s "closed-loop resource recycling system” initiative.

Until recently we generally landfilled digested sludge. We have since introduced a system to recycle it at the expense of the local government as the first such project in China. The system is particularly noteworthy in that it reduces environmental impact and offers economic benefit through the recycling of waste. The Jinzhou District faces a shortage of landfill sites, a situation that makes the new system so important. The implementation of this project demonstrates our government’s focus on economic growth in harmony with environmental conservation. We highly value its contribution toward conserving the environment in our district.

We contribute to the development of China in every field.

Atsushi Itaya  Managing Director, Dalian Onoda Cement Co., Ltd.

Today cement production and supply represent just one aspect of our social responsibility, since Dalian Onoda Cement has become a vital conduit for the city. When an oil pipeline exploded in Dalian New Port in 2010 we treated the recovered crude oil and contaminated soil at the request of the Dalian City government. We also dispatch our Chinese engineers to Japan for technical training, thereby promoting cooperation between Japan and China in the environmental field through the development of human resources. We will continue to contribute to China’s development in the spirit of solidarity and cooperation as a pioneering cement plant in terms of both product quality and environmental conservation.

We highly value the company’s contribution to resource recycling in our district.

Li Linlin  Director, Civic Management & Administrative Law Enforcement Bureau of Dalian Jinzhou New Area (Dalian Development Zone)

A total of 120,000 trees were planted across 500,000 square meters on the premises of Dalian Onoda Cement, which now look like a park. With its waste heat power generation system supplying one third of the electricity it consumes, the plant boasts world-class productivity and eco-efficiency.