

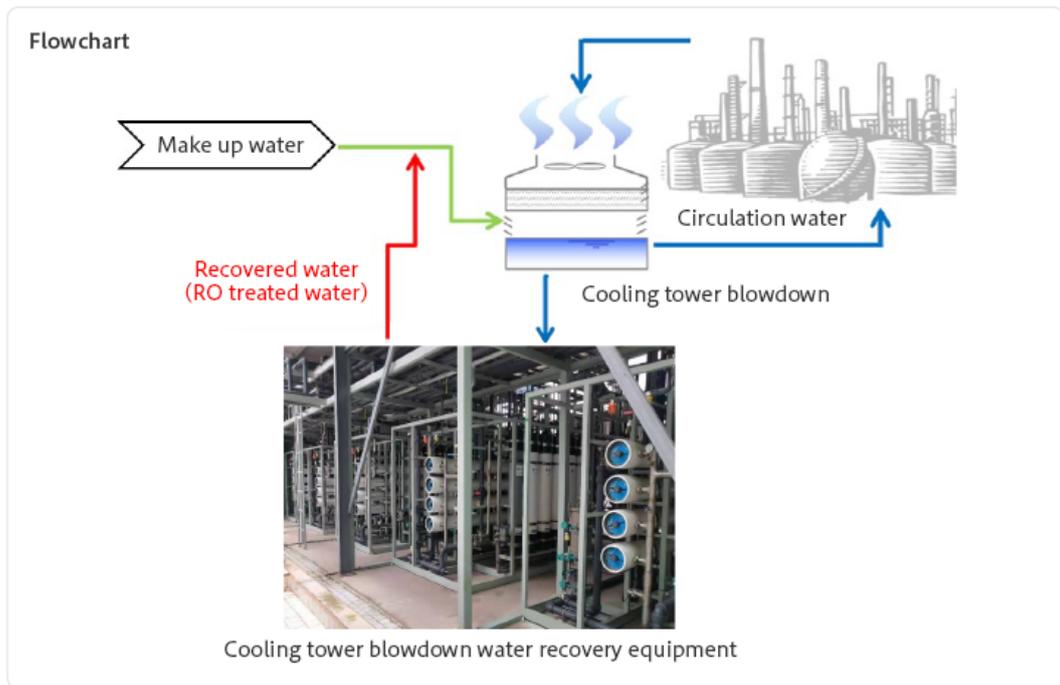
Solve Issues Related to Water Resources

Zhejiang Satellite Petrochemical: Environmental Improvement Case Study (Project by Kurita Water Industries (Dalian))

Zhejiang Satellite Petrochemical Co. Ltd. manufactures chemical products, mainly using propane dehydrogenation (PDH) technology. As part of its environmental protection policies, the Chinese government is calling on companies to save energy, reduce emissions and support China’s transition to a low-carbon, green economy. In response, Zhejiang Satellite Petrochemical has been working to conserve water and reduce wastewater.

Zhejiang Satellite Petrochemical’s manufacturing plant uses industrial water as cooling water. The quality of the plant’s industrial water tended to fluctuate depending on the season, so when water quality declined, the customer was forced to increase blowdown water volume from its cooling towers to ensure the smooth operation of cooling equipment. That in turn led to an increase in the volume of make-up water supplied to the cooling towers and also the amount of wastewater discharged from the plant.

To address that issue, Kurita Water Industries (Dalian) Co., Ltd. developed a proposal to limit the amount of industrial water used by the plant by installing membrane filtration equipment to treat and reuse cooling tower blowdown water within the water quality design parameters of the cooling equipment. The proposal was adopted by Zhejiang Satellite Petrochemical in 2015, helping it save 1.2 million m³ of industrial water used and discharge water by the end of 2020. The project has set the benchmark for environmental protection in the area and has been highly praised by the local government. Zhejiang Satellite Petrochemical expanded its cooling tower blowdown water recovery equipment in 2021 and expects to save a further 490,000m³ of industrial water and discharge water each year.



Voice of the Customer

Kurita is a highly professional water treatment company that provides us with advanced technical support and onsite services in water treatment facility operation. Kurita’s cooling tower blowdown water recovery equipment has helped us achieve our targets for saving water, reducing water discharge and cutting costs. Additionally, by improving the quality of local water resources, we are playing our part in the development of the local community. We have seen first-hand how Kurita’s advanced technological capabilities provide real value to society.



Mr. Yunwei Su
Zhejiang Satellite Petrochemical Co. Ltd.

Seiko Epson: Environmental Improvement Case Study (Project by Kurita Water Industries)

Seiko Epson Corporation's business is focused on the production and sale of printers and related products. To be "an indispensable company" – one element of its management philosophy – Seiko Epson is working to solve social issues through its business activities. At each of its business sites, Seiko Epson works on an ongoing basis to reduce its environmental impact, such as by cutting plant water usage and greenhouse gas emissions, in line with its Environmental Vision 2050.

To help the plant achieve its environmental goals, Kurita Water Industries Ltd. put forward a proposal to reclaim and reuse wastewater from the ultrapure water production systems used in the plant's manufacturing processes. The RO membrane water treatment system, one of the ultrapure water production systems, discharges water with high levels of ions and impurities (brine) from the feed water, but much of the discharged water has been emitted as wastewater. To address this issue, Kurita identified a reprocessing method and an application for reuse at the plant based on the concentration and type of impurities in the brine. Since adopting the proposal, the customer has reduced its potable water usage by around 38,000m³ per year. The ultrapure water production systems also incorporate a warming step to improve the permeation efficiency of water for production processes. By recovering heat from the reclaimed water, the new system has also reduced the plant's CO₂ emissions by 26 tons per year.



Brine reclamation system

CMK Corporation Thailand: Environmental Improvement Case Study (Project of Kurita-GK Chemical)

CMK Corporation Thailand Co., Ltd. primarily manufactures printed circuit boards for automobiles. Producing circuit boards requires the use of large amounts of water for cleaning, and the company uses more water than any manufacturing plant in the CMK Group, so reducing the amount of water it consumes has been an ongoing issue.

Kurita-GK Chemical Co., Ltd. proposed reducing water usage by raising the processing efficiency of the company's RO membrane facilities, which are the main piece of equipment used to manufacture water for cleaning. RO membranes filter out impurities and inorganic salts. After passing through the membranes, the water is used as industrial water, and water containing inorganic salts is processed as wastewater. When biofouling occurs on the surface of the membranes, it reduces permeated water volume, which increases the amount of water used. To address this problem, Kurita-GK Chemical applied water treatment chemicals that control biofouling on the RO membranes to successfully reduce water usage by 310,000 m³ per year. In addition, the frequency at which the RO membranes are cleaned has been reduced from once per week to once every two months, and the frequency at which the cartridge filters, which are installed upstream from the RO membrane facilities, are replaced has been reduced from once per week to once every 1.5 months.



RO membrane facility

Voice of the Customer

KURITA's RO chemical and consulting service provided us a great improvement in RO operation. We could operate RO system smoother and reduce total cost saving. Thank you, KURITA team, for their support.

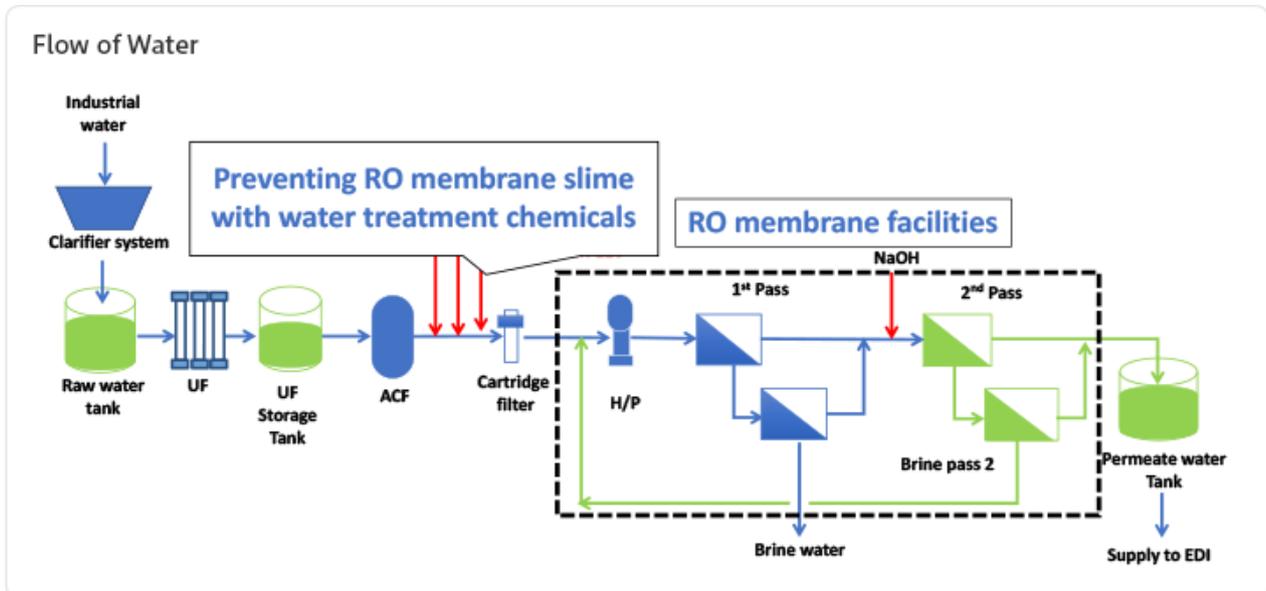


Mr. Wittaya Srisuwan
Factory Engineering

PTT Public (Rayong Gas Separation Plants): Environmental Improvement Case Study (Project of Kurita-GK Chemical)

PTT Public Company Limited is a petroleum and natural gas provider, the largest energy company in Thailand. The PTT Group promotes CSR activities based on the PTT Group SSHE (Security, Safety, Health and Environment) Management Standards with the goal of being an 'Advanced and Green National Oil Company.' The company's Rayong Gas Separation Plants had a problem with biofouling in its RO membrane facilities, which are used in water, reducing the amount of water passing through the membranes and requiring cleaning to maintain water volumes.

Kurita GK Chemical Co., Ltd. proposed using water treatment chemicals to prevent RO membrane biofouling. The proposal was adopted and resulted in stabilizing the amount of water passing through the membranes and also reduced membrane cleaning frequency from once every two months to once every four months, which served to reduce the amount of water used by 1,260 m³ per year, including cleaning water. In addition, optimizing management of RO membrane facility operations and reducing the load on the water supply pumps caused by biofouling served to reduce electricity consumption by the equivalent of 11.5 tons-CO₂.



Voice of the Customer

In this case, Kurita's proposal can reduce water and energy consumption after CIP by Kurita's treatment program. RO can operate normally and have good condition. So, it can reduce a risk of membrane cracking. RO membrane can extend the operating time because of the performance as same as new membrane. I would like to thank Kurita for recommendation for saving cost. And we look forward to receiving more improvement proposal to cooperate together.



Mr. Thodsaphon Phansadsadee
Process Engineering and Optimization Division,
Production Planning and Technical Management Department

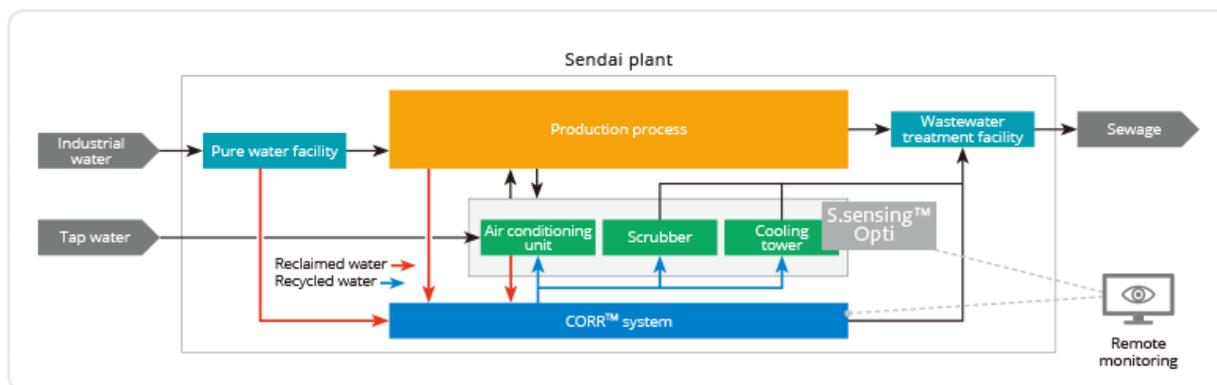
Sendai Plant of Kanazawa Murata Manufacturing: Water Usage Reduction Case Study (Project of Kurita's Recycled Water Supply Service)

Reductions of **40%** in Tap Water Usage and **30%** in Sewage

At the electronic components manufacturer Kanazawa Murata Manufacturing Co., Ltd., an environmental initiative based on the Murata Manufacturing group's environmental action plan is under way. The Group has set a target for reducing water usage per production volume, and has set about reducing the volume of water used at its Sendai plant. Kurita Water Industries proposed a recycled water supply service that reclaims and recycles wastewater to help this customer achieve its goals. The service is a contract with the customer to supply recycled water, including operation and management of the CORR™ wastewater reclamation system. In applying this service, we cooperated with the customer to investigate the volume and quality of the reclaimable wastewater at each outlet, and to select areas for use of the recycled water depending on its quality. In this case, since the recycled water is used as make-up water for a cooling water system, we also provided cooling water quality management using the S.sensing™ Opti remote monitoring system.

Using the service has enabled the customer to use water in the plant more efficiently, and the customer expects to achieve reductions of 40% for tap water and 30% for sewage compared to fiscal 2018.

Conceptual Diagram of Recycled Water Supply Service



Voice of the Customer

Since introducing this service, we are delighted to have achieved the reductive effect on water usage as initially planned, as well as reducing labor for facility management. Furthermore, when we were at the stage of considering applications, various departments of Kurita Water Industries helped us to maximize the benefits of water usage reduction, demonstrating Kurita's powerful capabilities. We are now looking forward to receiving proposals for further reducing our environmental impact by expanding the scope of application and looking at management of water facilities throughout our entire plant.



Mr. Etsuhiro Saito
Administration SEC
Sendai Plant

Teijin Polycarbonate China: Water Saving Case Study (Project of Kurita Water Industries (Dalian))

Water usage Reduced by **30%**

Teijin Polycarbonate China Ltd. manufactures polycarbonate in China. China's annual water resource per person is significantly lower than the global average, causing environmental regulations on matters such as water usage restriction and water quality of wastewater to grow tighter every year. Some regional regulations are tougher than the national regulations, and Teijin Polycarbonate China faced an urgent task to reduce its water usage.

Kurita Water Industries (Dalian) Co., Ltd. worked with the customer to check the volumes of water use and wastewater, as well as water quality, for the entire plant. Then, we proposed using an RO membrane facility* to treat and reclaim water from cooling facilities and plant waste water with a low degree of contamination. The customer accepted the proposal, which has enabled a reduction of around 30% in water use across the entire plant.

※A facility for filtering water using a reverse osmosis (RO) membrane that allows water to pass through while preventing the passage of impurities such as ions and bacteria.

RO membrane facility



Voice of the Customer

Reducing the volume of water usage was a major challenge for us. We are very grateful for this proposal for an appropriate countermeasure, which has delivered the expected results.

Now we have asked Kurita to look into ways to further increase the volume of water that we reuse. We look forward to your continued assistance.



Manufacturing Department Manager
Masahiro Ishida

*Position is as of fiscal 2019.

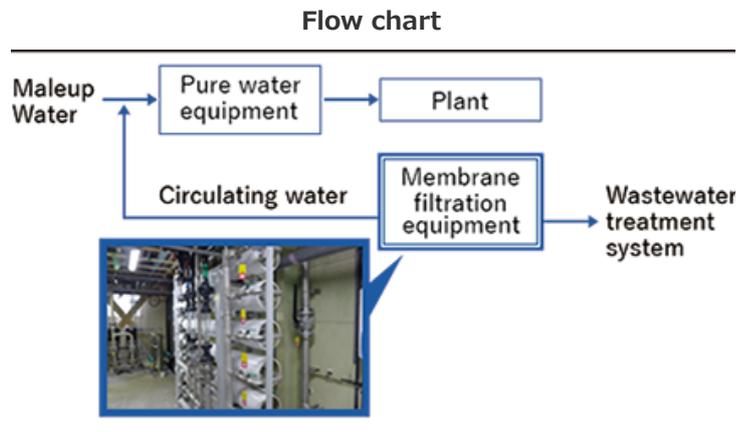
SHINKO ELECTRIC INDUSTRIES Takaoka Plant: Water Saving Case Study (Project of Kurita Water Industries)

Annual water consumption Reduced by **25,000m³**

SHINKO ELECTRIC INDUSTRIES CO., LTD. mainly manufactures semiconductor packages that achieve the miniaturization and high functionalization of electronics products. The company positions environmental protection as one of its top management policies. To minimize water consumption at its plants, this customer collects and reuses as much water used for production as possible. However, the properties of the discharged water changed when the company modified the production volume and method in response to changes in its business environment. Consequently, it was becoming difficult to maintain a balance between the quality and quantity of water used at its plants. Kurita Water Industries proposed an improvement measure, with which water quality is improved by removing organic constituents, which were affecting the quality of pure water, by means of membrane treatment. The customer adopted our proposal. As a result, the amount of reusable circulating water increased, and it became possible to reduce the amount of makeup water, enabling water consumption to be reduced by 25,000m³/year.

Voice of the Customer

We evaluate this proposal highly because it has enabled us to stabilize the quality of pure water and reduce the number of parts that are replaced due to the adhesion of dirt from organic constituents. We expect Kurita to give us further proposals for reducing the environmental impact of our plants and ensuring stable operations.



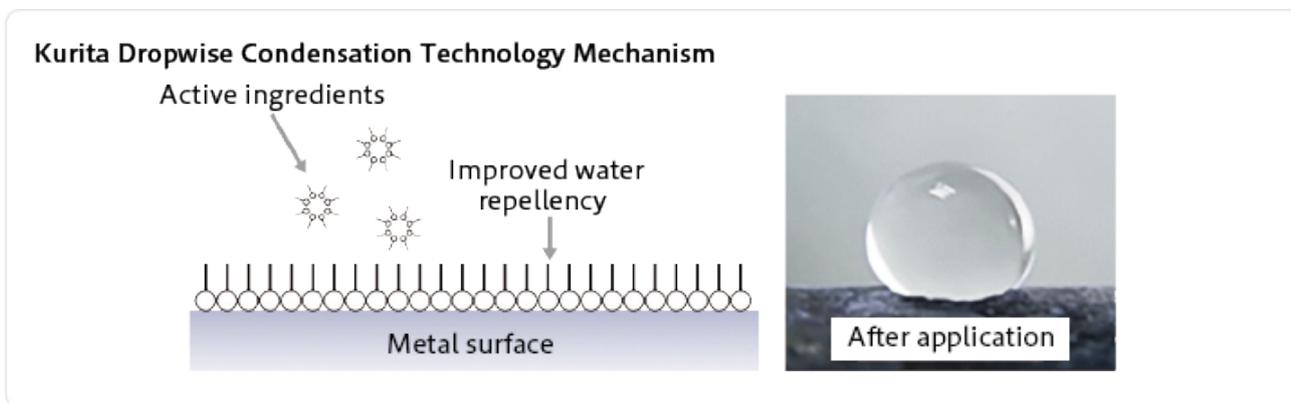
Mr. Takeshi Matsuki
Manager of Facilities Management Department II,
Environmental Management Division
*Position is as of fiscal 2018.

Realize Sustainable Energy Use

Thai United Awa Paper: Environmental Improvement Case Study (Initiative of Kurita-GK Chemical)

The main business of Thai United Awa Paper Co., Ltd. is the manufacture and sale of filter paper for automotive engines and separator base paper for storage batteries. As a member of the Awa Paper Group, the company is working to reduce its environmental impact based on the Group’s environmental policy. An ongoing issue in particular has been reducing energy usage in the paper manufacturing process.

Kurita-GK Chemical Co., Ltd. proposed to reduce the volume of steam consumed by incorporating Kurita Dropwise Condensation Technology into the dryer used in the drying process. This technology improves thermal conductivity by making metal surfaces water repellent. In the drying process, wet paper is dried by being brought into contact with a steam-heated metal dryer. Steam condensation causes a film of water to form on the surface on the steam side of the dryer. This film lowers thermal conductivity significantly. This was causing more steam to be needed to heat the dryer to appropriate temperatures. By adopting Kurita-GK Chemical’s proposal to eliminate the water film, the customer reduced the amount of steam used by 12%-25% per paper production volume.



* Kurita Dropwise Condensation Technology won the Agency of Natural Resources and Energy Director-General’s Award in the Product and Business Model category of the 2019 Energy Conservation Grand Prize, organized by The Energy Conservation Center, Japan.

Voice of the Customer

This proposal achieved a far greater impact than we imagined, and the volume of steam used was reduced significantly. Continuing to use this technique will also help control corrosion, so we expect that it will also be effective in lowering maintenance costs.

We look forward to ongoing proposals and cooperation as we seek to further reduce costs and environmental impact in our operations.



Mr. Takafumi Tomai
Factory Manager
Thai United Awa Paper Co., Ltd.

CELUPA INDUSTRIAL CELULOSE E PAPEL GUAÍBA: Environmental Improvement Case Study (Project of Kurita do Brasil)

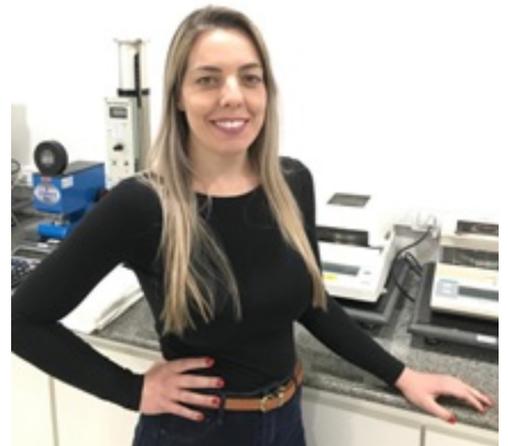
CELUPA INDUSTRIAL CELULOSE E PAPEL GUAÍBA LTDA. manufactures various types of specialty papers for sterilization processes, food packaging and the production of coffee filters. The papermaking process requires the use of steam, so one challenge at the company is reducing the amount of fuel used for steam generation, thus reducing CO₂ emission as well.

Kurita do Brasil LTDA. proposed the use of a new technology "KURITA PJ" for raising thermal conductivity by water-proofing the metal surface of the paper drying drums that are heated by steam. A layer of water is formed inside the drying drums when steam condenses on the metal surface in contact with the steam. Even when extremely thin, this water membrane greatly reduces heat conductivity, which causes more energy to be consumed in the papermaking process. Kurita do Brasil proposed a technology to eliminate this water membrane. Treating the steam with a water-proofing chemical successfully reduced the amount of heat needed, which in turn reduced the fuel consumption per ton of paper produced by 2.8%.

Voice of the Customer

Application of PJ Technology has been advantageous for our process. In addition to the reduction in steam consumption, we achieved environmental gains by reducing the carbon footprint and consumption of fresh water to produce the steam.

With Kurita PJ the process works in stability and brings important gains for CELUPA.



Ms. Natalie Figueiredo da Silva
Quality Control

Fuji Clean: Energy Creation Case Study

Reducing annual CO₂ emissions by **10,000 t**

Fuji Clean Co., Ltd.'s businesses range from collection and transportation of waste to intermediate treatment* and final disposal in landfill. It contributes to society through safe treatment of waste. Fuji Clean developed a concept of creating renewable energy by methane fermentation of waste, and contributing to the local community that provides the waste by supplying electric power and heat during disasters. Since the areas surrounding the company's facilities and the area downstream are prospering agricultural areas, the company needed a treatment that did not produce wastewater, and was seeking for a partner with suitable technologies. Kurita Water Industries proposed production of biogas from waste using the dry methane fermentation technology that it has developed over many years. This methane fermentation technology is able to treat waste such as paper waste, which has a high organic matter content and low water content, and does not produce wastewater. Since it met Fuji Clean's requirements, the proposal was accepted. Moreover, through this proposal, Fuji Clean's project was selected as the Demonstration Project for Regional Autonomous Biomass Energy System by the New Energy and Industrial Technology Development Organization (NEDO), and is currently being trialed. Furthermore, the biogas generated by the dry methane fermentation reactor is used as fuel for an onsite boiler and power generator, reducing the use of electricity and fossil fuels, and attendant CO₂ emissions.

* Intermediate treatment: Minimizing the volume of waste for landfill by separating it and then crushing or incinerating it.

Voice of the Customer

We decided to adopt Kurita Water Industries' dry methane fermentation technology because it was suitable not only for our vision, but also for the condition of the waste that we receive. Since the types and volume of waste change day by day, we encountered some difficulty in setting up a dry methane fermentation reactor, but we were glad have Kurita alongside us as we strove to establish a method for operation and management. We hope to receive further input from Kurita on biogas generation, as well as cooperation on our social contribution activities.

Dry methane fermentation reactor



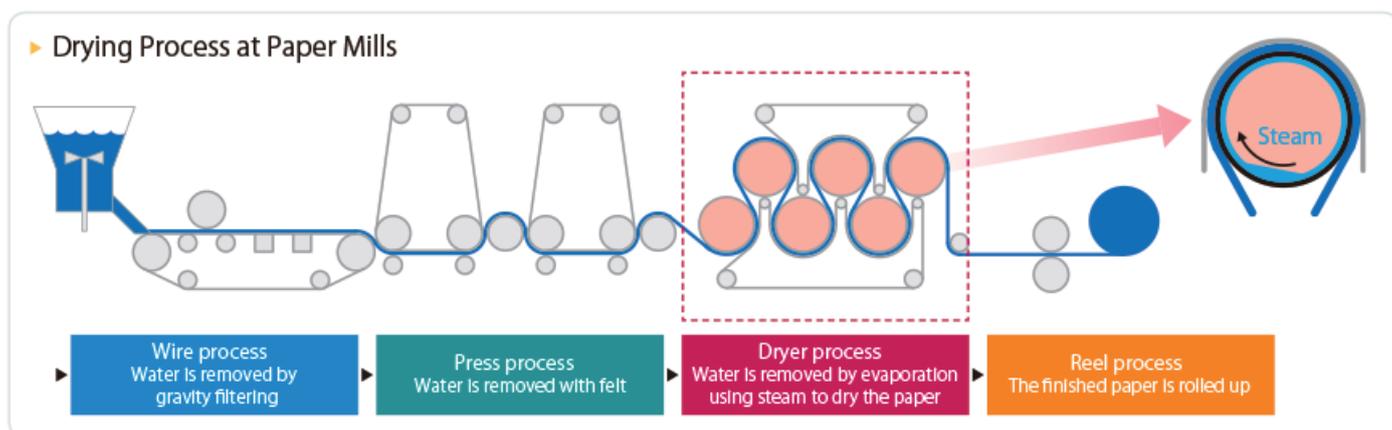
Mr. Hisato Kinjo
General Manager, Renewable Energy Department
Dry Methane Fermentation Plant

Paper Mills: Energy-Use Reduction Case Study (Project of Kurita Water Industries)

Per-unit Use of Steam Reduced by **5 to 10%**

At paper mills, paper is created through a pulping process and paper-milling process. In the paper milling process, the water content is removed from the wet paper that will become the finished paper through application of pressure and a mechanical water removal process. After that, the paper is dried with a dryer and rolled up. The dryer used in this process is formed from a metal cylinder. The paper is spread over the surface, which is then heated. To heat the dryer, steam is passed through the interior. Heating accounts for most of the overall energy usage at the plants. Therefore, reducing the energy used in the process was an important challenge at paper mills.

Kurita Water Industries noted that water from the steam adhering to the inside of the dryer caused a drop in heat conduction efficiency. At many paper mills we have proposed adding a water treatment chemical that forms a water-repellent film to the steam, so that the film adheres to the inside of the dryer and improves heat conduction efficiency. Plants that have adopted this proposal are able to reduce their per-unit use of steam by around 5-10% per year on average, with the reduction in energy leading to a reduction in CO₂ emissions.



Daicel Safety Systems: Energy-Use Reduction Case Study (Project of Kurita Water Industries)

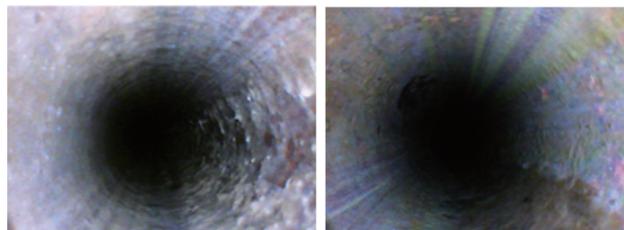
Electric power consumption Reduced by **44%**

Daicel Safety Systems Inc., which mainly produces inflators for car airbags, needed to improve the energy efficiency of its businesses activities in line with the Daicel Group's Responsible Care Basic Policy.

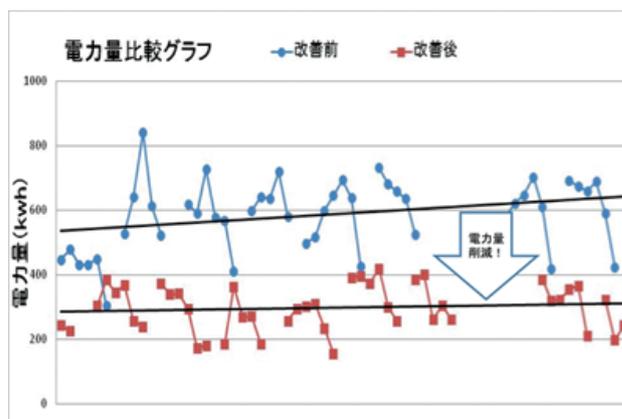
For this customer, one of the issues was improving the energy efficiency and reducing energy use of its cooling water equipment for air conditioning. Kurita Water Industries proposed first removing scales that formed on the heat exchanger of the cooling water equipment and then inhibiting their formation using water treatment chemicals.

Having adopted these proposals, the Company reduced power use 44% by optimizing the heat exchange efficiency of the cooling water facilities, and it was possible to maintain those benefits.

Heat exchanger interior before the cleaning (left)
After cleaning (right)



Comparison of electricity use before and after proposal adopted



Voice of the Customer

We thought highly of Kurita Water Industries' proposal because it was appropriate for the issues we faced and it was possible to dramatically reduce energy use as expected.

In the future, we expect to work with Kurita Water Industries to introduce the proposal horizontally throughout the plant and receive other proposals to improve the quality of industrial water.



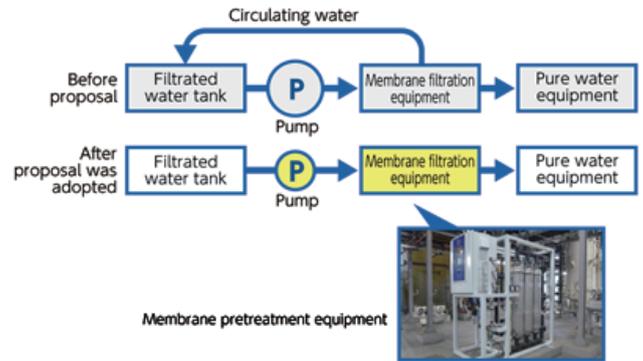
Mr. Kosuke Inoue
Production Engineering
Department
*Position is as of fiscal 2018.

HGST Japan: Energy-Use Reduction Case Study (Project of Kurita Water Industries)

Electric power consumption Reduced by **90%**

HGST Japan, a manufacturer of hard disk drives and other electronic devices, is striving to reduce the environmental impact of its business activities in line with the Western Digital Group's environmental policy.

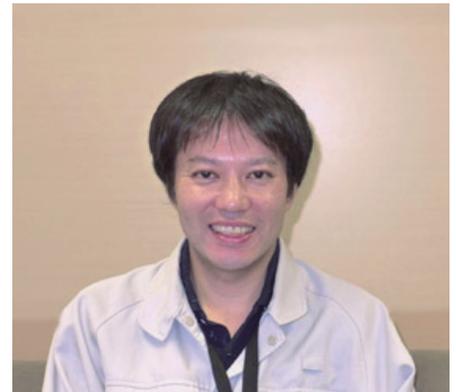
For the customer, a continuous reduction in energy use became an issue because it is a designated energy management factory. Kurita Water Industries proposed replacing the membrane filtration equipment with a more efficient one. The previous equipment included a large pump because circulating water returning to the previous stage was necessary due to the original operational condition, but with the new equipment, a small pump can be used because circulating water is not required.



Voice of the Customer

In this case, the proposal was made when we were working to improve energy efficiency, and we adopted it as the improvement was easy to understand and there were substantial benefits. Replacing the old equipment with new smaller equipment made it easier to conduct maintenance and lowered costs, which was helpful.

Improving energy efficiency is an ongoing issue, and we hope for additional proposals for improvements.



Mr. Haruki Chiba
Real estate operations
Facility engineering
Engineering Manager
*Position is as of fiscal 2018.

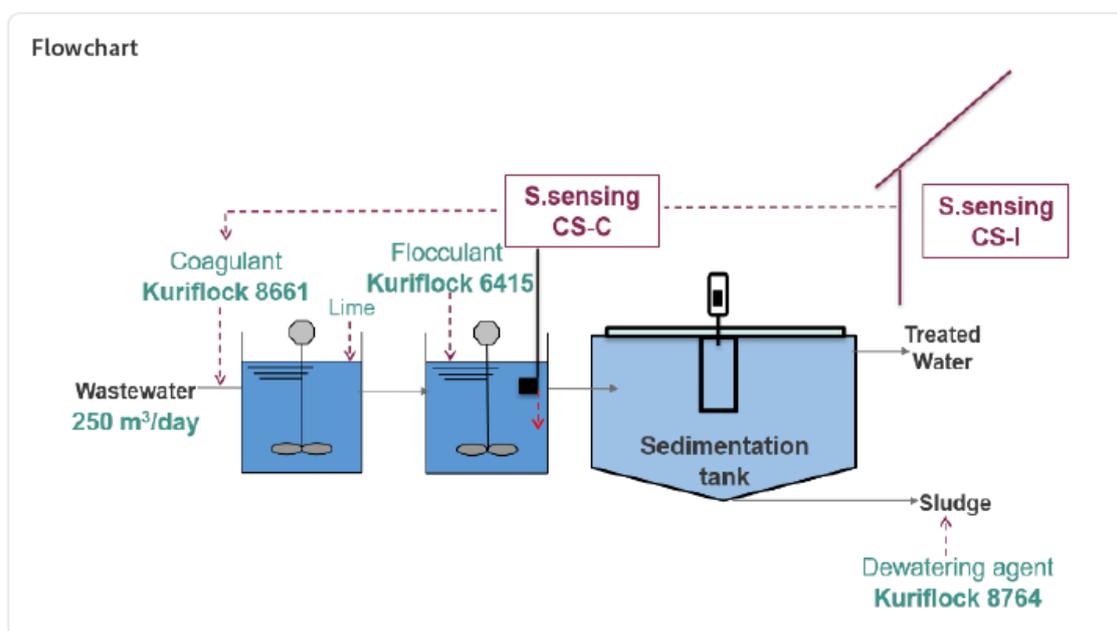
Starwood Forest Products: Environmental Improvement Case Study (Project by Kurita Europe)

Starwood Forest Products AS is a wood processing company headquartered in Turkey. Its main products are wood board and impregnated paper*. Guided by its motto "Infinite Respect to the Environment," Starwood has gained ISO 50001 Energy Management System and ISO 14001 Environmental Management System certification and is working to improve environmental performance. The company has also installed electrostatic filters to remove dust from the air in its facilities as part of its emphasis on employee working conditions and the environment.

To reduce industrial waste, Starwood incinerates sludge generated by its wastewater treatment facilities. However, the customer wanted to cut the volume of sludge in order to further reduce industrial waste and minimize energy used in the incineration process. A large amount of the sludge originates from water treatment chemicals (coagulants and flocculants) that is added to the wastewater as part of the treatment process. To address that issue, Kurita Europe GmbH (KEG) developed a proposal to monitor flocculant levels in real time using laser-based S.sensing CS technology. KEG also offered its Kuriflock water treatment chemicals as part of the package. The system optimizes chemical dosage levels and monitors water discharge quality while also reducing the volume of sludge.

After adopting the proposal, Starwood was able to cut coagulant usage by 20% and reduce industrial waste by around 21 tons per year. The system also automatically adjusts flocculant treatment in response to wastewater quality, helping to stabilize wastewater treatment and reduce manpower needed for system operation.

* Paper impregnated with resin.

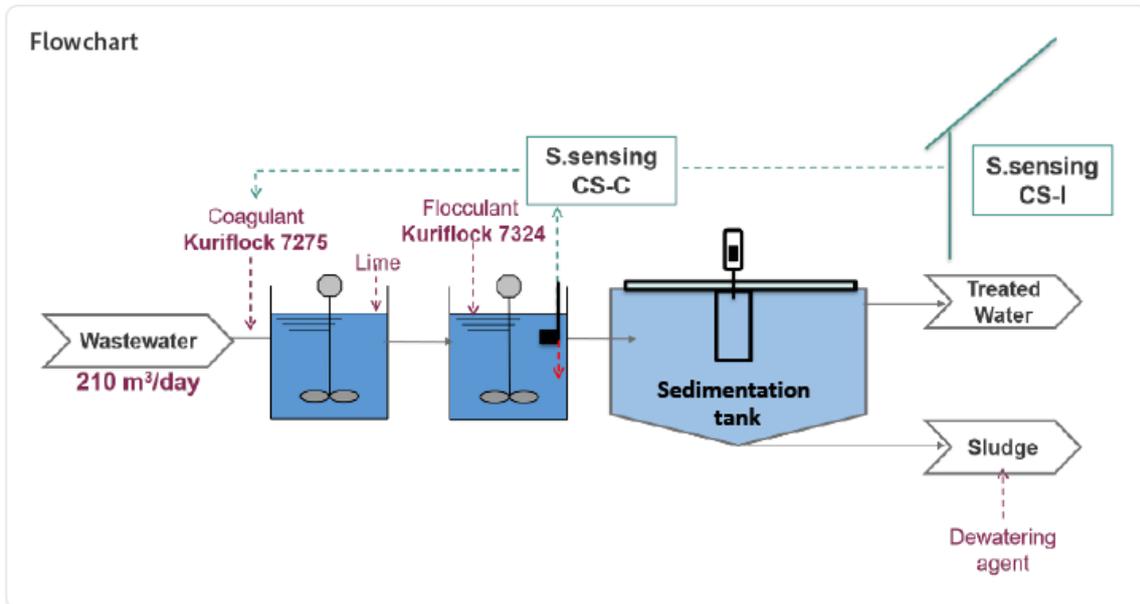


Voice of the Customer

The online monitoring and control of the wastewater treatment facilities proposed by KEG allowed us to significantly reduce both the amount of coagulant additives and the amount of sludge derived from the coagulant. The system also operates smoothly and properly in pH conditions ranging widely from 6 to 9, and has yielded an improvement in effluent quality, including a 15% reduction in chemical oxygen demand. In addition, since manual control is no longer necessary, manpower needed for system operation at the wastewater treatment facilities has been shortened, while the sludge water content has decreased, resulting in smoother dehydration and incineration processes. (Mr. Yusuf Uzunoğlu)

Nissan Zona Franca Factory (Barcelona): Environmental Improvement Case Study (Project by Kurita Europe)

The Nissan Zona Franca Factory (Barcelona) is one of the Nissan Group's European production sites. Based on its ISO 14001 environmental certification, the factory carries out environmental improvement activities that involve the whole workforce. To achieve Nissan's environmental goals, employees at the factory receive pocket-size booklets with a checklist of environmental best practices and undergo rigorous environmental training. Like other automakers in Europe, Nissan's wastewater treatment processes involve hand samplings, laboratory analyses, and visual control of discharge, as well as higher-than-needed "just-in-case" additives of water treatment chemicals (coagulants and flocculants). This approach has led to an increase in the volume of sludge derived from such chemicals as well as unstable wastewater treatment. To tackle those issues, Kurita Europe GmbH (KEG) developed a proposal to appropriately monitor and control wastewater treatment facilities online using its S.sensing CS technology. After adopting the proposal, the factory was able to reduce manpower in wastewater treatment facility operations and stabilize water quality. The system also reduced coagulant volume by 30% through optimized product control and cut industrial waste by around 21 tons annually.



Voice of the Customer



Mr. Jorge Jiménez



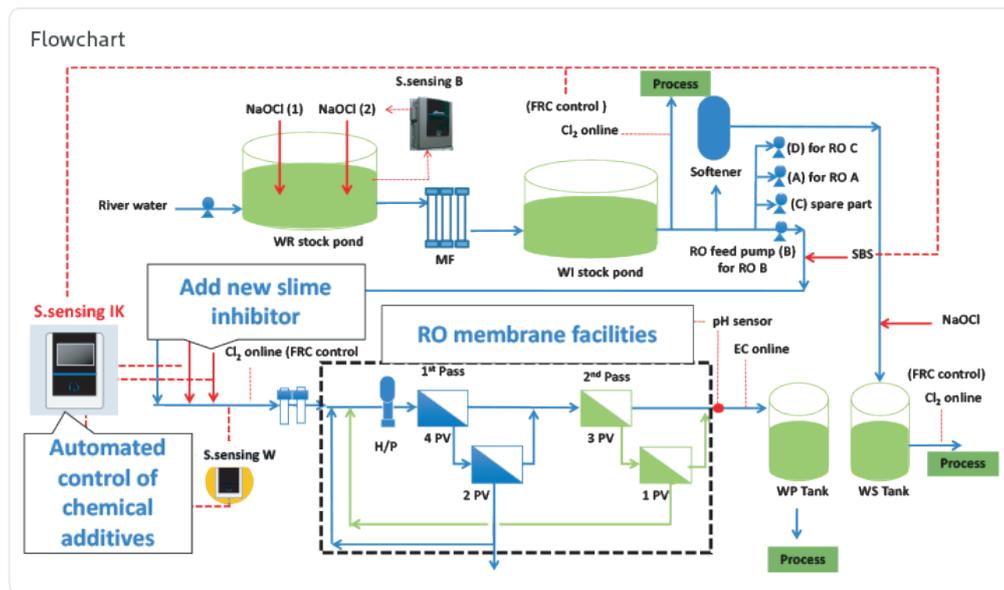
This project received a letter of reference from the customer.

Ajinomoto (Thailand) (Ayutthaya Plant): Environmental Improvement Case Study (Project of Kurita-GK Chemical)

Ajinomoto Co., (Thailand) Ltd. (Ayutthaya Plant) in Thailand primarily produces umami seasonings. The company is a member of the Ajinomoto Group and as such works to reduce greenhouse gases and plastic waste. To reduce the environmental impact of RO membrane facilities that are used to manufacture industrial water at the plant, Kurita-GK Chemical Co., Ltd. proposed lengthening the operational life of the RO membranes to reduce waste and electricity consumption.

RO membranes can collect biofouling* and other substances on their surface, making it difficult for water to pass through. This increases the load on the pumps used to supply water to the membranes and increases electricity consumption as a result. Moreover, to maintain water production volumes, the RO membranes have to be cleaned and replaced regularly. The solution proposed by Kurita-GK Chemical applies new water treatment chemicals that inhibit biofouling and uses sensors to optimize the levels of chemical additives needed for stable membrane operations. After the solution was adopted by the plant, cleaning frequency decreased, RO membrane waste declined 0.4 tons per year and electricity consumption dropped by the equivalent of 8.5 tons-CO₂. The amount of cleaning agents and wastewater from membrane cleaning also decreased. In addition, sensor-based control has made it possible to reduce the amount of chemical additives as well.

* Pollutants formed by microorganisms such as bacteria and algae in water.



Voice of the Customer

S.sensing and IK from KURITA can control the amount of chemicals use in the RO system very well and save maintenance cost of membrane RO.



Mr. Sanan Kinkasorn
Utility & Biomass Department

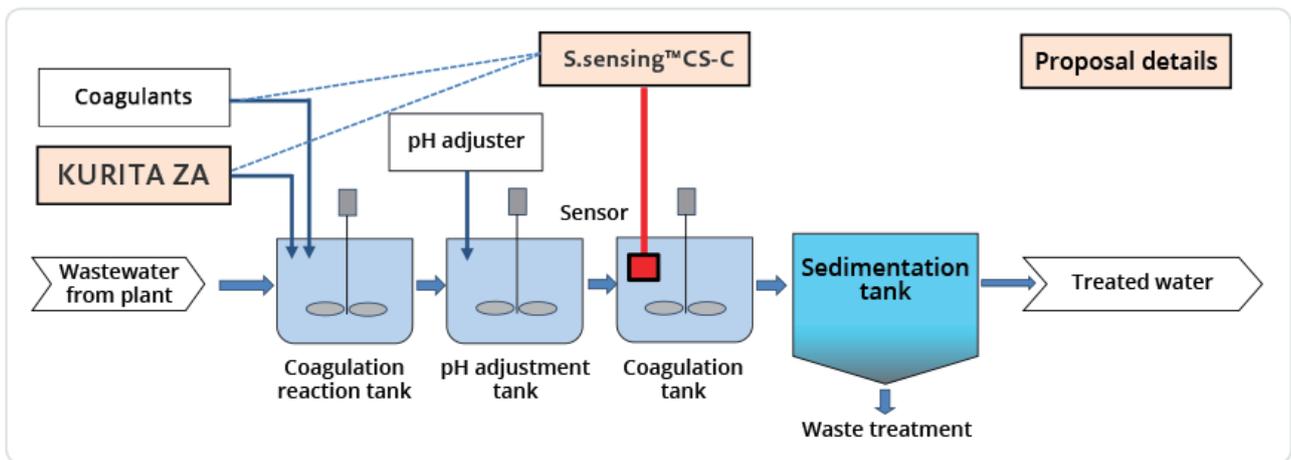
Precision Equipment Manufacturing Plant: Waste Reduction Case Study

Reducing Waste Arising from Chemicals

At the plant of a customer who manufactures precision equipment in Thailand, wastewater from the manufacturing process is purified by coagulating suspended solids from the dicing process and so forth in a wastewater treatment facility. The coagulation process separates out matter suspended in the water by solidifying it into a mass using chemicals. The chemicals used are formed into a solid mass along with the suspended solids, and emitted as final waste product. Reducing the waste product at the plant was therefore a matter of reducing the amount of chemicals used.

Kurita-GK Chemical Co., Ltd. proposed using the water treatment chemical KURITA ZA to promote the coagulation effect of the chemicals used at the plant, and the introduction of the S.sensing™ CS-C sensor to confirm the coagulation status in real-time, allowing optimization of the amount of chemicals used. After implementing this proposal, the customer achieved a reduction of more than 80% in the amount of chemical usage, which led to an attendant reduction in the amount of chemical originated waste. Furthermore, since the coagulation status is now able to be grasped using the sensor, the customer is also able to reduce the amount of labor used in management.

Image of Wastewater Treatment Process and Proposal Details



Sabae Murata Manufacturing: Waste Reduction Case Study (Project of Kurita Meiki)

Waste volume Reduced by **95%**

Electronics manufacturer Sabae Murata Manufacturing Co., Ltd. is part of the Murata Group, and is making efforts to reduce its environmental impact towards achieving the Group's medium-term environmental targets. Changes in the company's production items and an increase in production volume caused some of the production facilities to generate concentrated wastewater that could not be treated with its existing wastewater treatment facility. Since the entire volume of this was treated as waste, reducing the amount of concentrated wastewater became an urgent priority.

Kurita Meiki proposed reducing the volume of concentrated wastewater using a vacuum concentrator. This equipment reduces the atmospheric pressure, causing the water content to evaporate at a lower boiling point and thereby reducing the volume. Heat is required to evaporate the water, but the evaporation heat is reclaimed using a heat pump and then reused for heating. After accepting the proposal, Sabae Murata Manufacturing Co., Ltd. was able to achieve a 95% decrease in the volume of concentrated wastewater that was treated as waste.

Voice of the Customer

Thanks to this proposal, we can now see the way forward to increasing production while reducing waste. Moreover, the proposal has been reported to the Murata Environment Committee and has also been highly appreciated by management. Waste reduction is a never-ending task, and we hope to receive further assistance from Kurita Meiki, going forward.

Vacuum concentrator



Mr. Daisuke Yokozawa
Team Leader,
Administration Section
*Position is as of fiscal 2019.

NIPPON SURFACTANT INDUSTRIES Nasu Factory: Waste Reduction Case Study (Project of Kurita Water Industries)

Reduction in waste amount **28.5%**

The Nasu Factory of NIPPON SURFACTANT INDUSTRIES CO., LTD. manufactures various chemical products that form the raw materials for pharmaceuticals, cosmetics, and so forth. The factory has acquired ISO 14001 certification and works continuously to reduce its environmental impact.

The company's wastewater processing facility was obliged to undertake sporadic pH adjustments and regular sludge removal to combat odors and destabilization of biological treatment caused mainly by coagulants. Moreover, the amount of chemical treatment usage was increasing, and elimination of the resulting sludge had become an issue. Kurita Water Industries proposed the use of a coagulant that did not contain the component that had been the primary cause of odors. The coagulant efficiently complemented the contaminant materials, so that the amount of additive could be reduced. This enabled a reduction in the amount of waste from coagulant as well. Furthermore, since the coagulant is slightly acidic, it had less of an impact on microbes. After the client accepted the proposal, their waste volume was successfully reduced by 28.5%.

Voice of the Customer

Kurita Water Industries' proposal not only reduced the amount of waste, but also reduced the amount of labor required for operation management and improve the level of safety. Since adopting the proposal, the frequency of sludge removal has been gradually declining, so we expect the amount of waste to decrease even further. We look forward to receiving more proposals from our trusted water treatment professional going forward.

Waste water treatment facility



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*Position is as of fiscal 2018.