July 10, 2023
Daiseki Eco. Solution Co., Ltd.

World First!! Construction of Facilities for Refining Bio-Diesel Fuel via Membrane Separation Process
— Adoption of 2023 Aichi Sound Material-Cycle Society Promotion Project Subsidy (Recycling-related Equipment Maintenance Business) —

Daiseki Eco. Solution Co., Ltd. ("the Company") is engaged in efforts toward realizing the goal of carbon neutrality through the production of bio-diesel fuel based on the use of waste cooking oils as a raw material. In response to our proposal to Aichi Prefecture regarding the use of a method for refining bio-diesel fuel based on a process of membrane separation, unprecedented for commercial plant facilities, we have been accepted to receive the 2023 Aichi Sound Material-Cycle Society Promotion Project Subsidy (Recycling-related Equipment Maintenance Business). With this subsidy, we plan to introduce membrane separation type refinement facilities within the current fiscal year.

Bio-Diesel Fuel Membrane Separation Type Refinement Test Plant

Before/After Membrane Separation

Credit: MUROMACHI CHEMICALS INC.

[Background and Details of Current Initiative]

Bio-diesel fuel is used as a carbon neutral substitute for diesel fuel in a variety of applications, including in vehicles, construction machinery, forklifts, power generators, and airport pushback tugs, as well as for marine fuel. Demand for the fuel is expected to be high in future.

The refining of bio-diesel fuel thus far has largely relied on small-scale distillation facilities, which has proved to be an inefficient means of refining and one with a sizeable environmental impact. However, by introducing refining facilities based on the membrane separation technique, the following effects can be achieved:

Improved production efficiency	Annual refining capacity 1,200 kL (Approx. 17-fold that of distillation equipment)
Reduced environmental load	Annual reduction of 507 tons of CO2 emissions compared to production of same amount using distillation method *Roughly equivalent to the annual CO2 emissions of 300 people in Japan
Increased adoption of high-quality bio-diesel fuel	The replacement of 1,200 kL of diesel fuel with bio-diesel fuel will result in a reduction of more than 3,000 tons of CO2 emissions *Roughly equivalent to the annual CO2 emissions of 1,700 people in Japan

Up until the present, it has not generally been possible to mass-produce products that meet certain industry standards such as JIS K2390 or EN 14214. While hydrogen and ammonia have received a lot of attention in recent years as potential fuels of the future, there remain many technical issues to overcome before their introduction becomes feasible, not least the high cost of introduction and the lack of progress in building the required infrastructure.

Daiseki Eco. Solution Bio Energy Center in which membrane separation facilities are to be installed (Tokai, Aichi Prefecture)

With the introduction of this facility, the supply of products which meet the aforementioned standards will increase, thereby increasing the range of diesel equipment that will become suitable for use. At the same time, bio-diesel fuel derived from waste cooking oils is expected to play an even greater role than ever before.
By leveraging our know-how regarding the production of biodiesel fuels, we will strive to help those of our customers who are considering reducing their CO2 emissions by ensuring the maximized use of the membrane separation processing facilities scheduled for introduction as mentioned here.

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