

FOR IMMEDIATE RELEASE

No. 2323

Product Inquiries:

Yutaka Kamada
Mitsubishi Electric Corporation
Tel: +81-3-3218-2391
Yutaka.Kamada@hq.melco.co.jp

Media Contact:

Oliver Cox
Mitsubishi Electric Corporation
Tel: +81-3-3218-2346
Oliver.Cox@hq.melco.co.jp

**MITSUBISHI ELECTRIC ANNOUNCES THE SUCCESSFUL
DEVELOPMENT OF A WASTEWATER FECAL BACTERIA
MONITORING SENSOR**

Achieves world's fastest measuring time

TOKYO, Feb. 17, 2004 — Mitsubishi Electric Corporation (President and CEO: Tamotsu Nomakuchi) has developed a new monitoring sensor for fecal bacteria in wastewater, capable of carrying out measurements within 30 minutes, the fastest time in the world.

By applying this sensor to the disinfection control system at a wastewater treatment plant (WWTP), the appropriate dosage of disinfectant can be minimized. By reducing the total discharge of residual disinfectant and the cost of disinfectants at the WWTP, this development is both environmentally and economically advantageous.

A paper concerning this development will be presented at the 41st annual technical conference of the Japanese Sewage Works Association (JSWA) (July 27th-29th, 2004, Pacifico Yokohama, Yokohama, Japan).

Background

The amount of fecal bacteria in a WWTP's discharge is legally required to be below 3,000cells/cm³. However, measuring the amount takes over 18 hours using a conventional "direct counting" method. Because the population of fecal bacteria in wastewater varies hour-by-hour, in order to satisfy the legal requirement it is common for disinfectants such as

chlorine and ozone to be discharged in excess. Therefore, in order to achieve the appropriate disinfectant dosage, a much faster way of measuring the fecal bacteria amount was required. Until now, there was no measuring sensor available which could complete the process within one hour.

Main Features

1. Measurement within 30 minutes via an enzyme fluorescence method and the elimination of interfering substances.

In order to speed up the process, the idea of conducting enzyme fluorescence measurements of enzymes peculiar to fecal bacteria was conceived. In conventional enzyme fluorescence measurements, however, it is necessary to increase the quantity of enzymes by culturing bacteria in order to obtain sufficient accuracy. In the present instance, it was realized that interfering substances in the suspended solids of 10 μ m particles caused a deterioration in measurement precision, and therefore it became necessary to sufficiently pre-filtrate samples. As a result, the quick and precise monitoring of fecal bacteria, without culturing, became feasible.

2. Accurate, automatic and continuous measurement by using flow injection analysis (FIA) and violet LED.

FIA enables automatic and continuous measurement, while the highly sensitive detection of fluorescence and a large reduction of maintenance work was achieved by using a violet LED inside of a fluorescence detector.

Experiments at an existing WWTP demonstrated that this monitoring system is able to measure the number of fecal bacteria within 30 minutes and demonstrates a good correlation with that of the conventional direct counting method, with a small averaged error of 180cells/cm³ in comparison with the legally required amount of 3000 cells/cm³.

3. Over 30% reduction of disinfectant amount by dosage control using the newly developed monitoring system.

In a simulation study of disinfectant dosage control using the newly developed monitoring sensor, the amount of disinfectant used was reduced by over 30% in comparison

to the conventional proportional control to water flow rate. The system was shown to be both environmentally and economically advantageous.

Future Developments

The monitoring sensor will be brought to market during 2004. An application of the system for the monitoring of the quality of recycled wastewater from a WWTP, and a highly efficient control system for disinfectant dosage, are also currently being developed. In addition, the overflow of raw sewage from sewerage systems in urban areas on rainy days is of particular social concern. We plan to improve the newly developed monitoring system by aiming for even quicker measurement in order to apply it to a sewage overflow disinfection control system.

Patents Pending

Five patents relating to this development are currently pending in Japan.

About Mitsubishi Electric

With over 80 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, Mitsubishi Electric Corporation (TSE: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. The company has operations in 35 countries and recorded consolidated group sales of 3,639 billion yen (US\$30.3 billion^{*}) in the year ended March 31, 2003. For more information visit <http://global.mitsubishielectric.com>

^{*}At an exchange rate of 120 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2003.

###