

# METTLER TOLEDO APPLICATION NOTE

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## Dissolved Oxygen Measurement In Municipal Waste Treatment

### BACKGROUND

New government regulations for effective municipal waste treatment will require at least two stages of treatment: (1) Reduction or removal of gross materials and (2) biological treatment. The most widely used biological treatment is "activated sludge," which calls for control of dissolved oxygen.

### THE PROCESS

In the activated-sludge process, aerobic bacteria feed on the raw waste, oxidizing it into carbon dioxide, water, and "sludge." The sludge may contain nitrated phosphates, sulfates, and highly active bacteria. Air, or in some cases oxygen, is forced into the waste basin (typically at a number of points) to increase the activity of these bacteria.

Dissolved oxygen in the basin is continuously measured, and air or oxygen is injected to maintain a set point that is adequate but not wasteful. The level of dissolved oxygen maintained will vary from plant to plant according to the particular waste type of bacteria, influent rate, temperature, etc., but usually at a level between 0.5 and 2.0 milligrams per liter (mg/l), with a lower value at the influent end and a higher value at the effluent end. Figure 1 describes dissolved oxygen

measurement in municipal wastewater plants. The top diagram follows the process in a conventional municipal wastewater system. Sewage enters the aeration basin. Oxygen is bubbled in to maintain the aerobic bacteria level. The DO sensor is placed in the aeration basin to monitor and control the dissolved oxygen. The bottom of the aeration basin fills up with sludge that is hauled to a solid waste dump. The clarified waste flows over the top of the aeration basin to other sedimentation tanks to clarify it further and then goes out to the ocean.

The bottom diagram is an alternative process used in some wastewater treatment plants.

### INSTRUMENTATION

Continuous measurement of dissolved oxygen is cost effective. Precise measurement eliminates the need for frequent sampling and laboratory testing. More importantly, it greatly reduces the expense of operating large blowers or air compressors. When guess work is involved, excess air is added as a safety margin.

The Mettler Toledo 4050 Dissolved Oxygen Analyzer coupled with the InPro® 6050 Dissolved Oxygen sensor is designed for continuous measurement of dissolved oxygen in waste treatment plants.

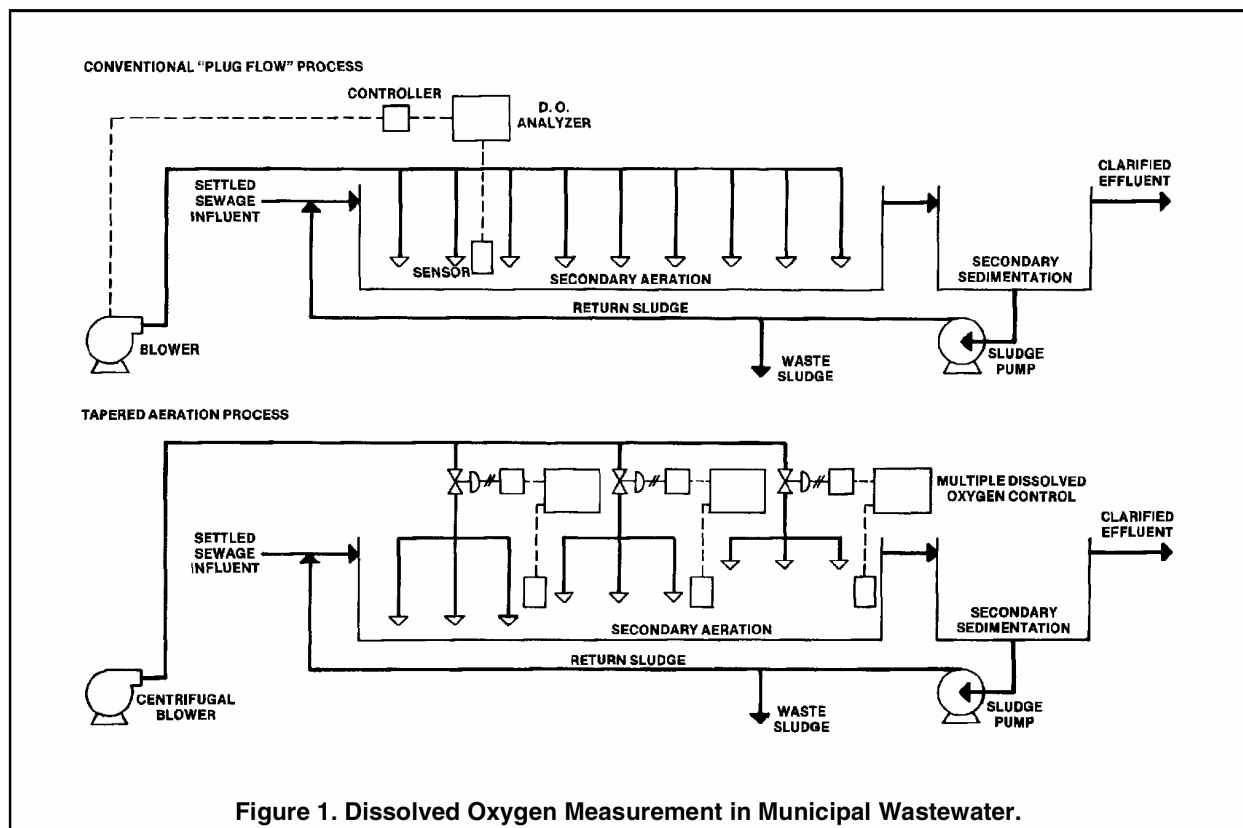
## PRODUCTS

### 4050 Dissolved Oxygen Analyzer

- Economically priced, full featured transmitter
- Large, easy-to-read LCD allows quick view of information
- Two relays as limit contacts with delay timer to minimize false alarms and one relay as alarm or wash contact

### InPro® 6050 Dissolved Oxygen Sensor

- Rugged, plastic sensor design for long life and low maintenance
- Integrated RTD for automatic temperature compensation
- Unique Teflon® coated membrane prevents fouling
- IP66, IP67 and IP68 rated VarioPin connector for quick cable disconnect



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