

# Real-time monitoring and process control for gasification of municipal solid waste

# Overview

Stable operation of a gasifier and the subsequent composition of syngas produced are significantly influenced by the oxidizing agent to fuel ratio, specifically defined as air-to-fuel ratio (A/F) or equivalence air ratio (ER) for air gasification. While the air supply is relatively easy to measure and adjust, the measurement and control of fuel feed during operation of the gasifier is challenging. The effective feeding rate fluctuates due to changes in the size of fuel particles/pellets, fuel compaction, fuel composition and/or feeder plugging. Inconsistent feeding rate causes unstable operation of gasifier with undesirable fluctuations of temperature, syngas composition, calorific value and volume. Therefore, development of an accurate and real-time method for monitoring and control of feeding rate is important for efficient operation of gasifiers.

## Applications

- ➔ Chemical process engineering
- ➔ Real-time monitoring and control

## Key features

- ➔ An innovative real-time monitoring and process control system for gasification of fuels.
- ➔ Accurate estimation of effective feeding rate of fuel based on operating parameters.
- ➔ Dynamic feedback about gasification process allowing for rapid adjustment of fuel feeding rate.
- ➔ Stable operation of gasifier and production of syngas with consistent quality.

## Market opportunities

- Gasification and incineration of biomass, municipal waste, coal, etc.

## Advantages and benefits

- A control system with rapid response, easy operation and low cost.
- High flexibility allows incorporation to any existing control system as an independent vector or as a complementary controller.
- High adaptability to different types of gasifiers.
- Applicable to gasifiers from laboratory size to commercial scale.

