

## High Temperature Dry Gas Cleaning Plant

### Purpose:

The plant is designed to remove multiple impurities at high-temperature in the fuel gas derived from various types of gasifier. The target performance is to attain the requirement of the clean fuel that is applicable to the high temperature fuel cells.

### Outlines:

This test facility will demonstrate the feasibility of a high temperature gas cleaning system that is able to maintain the cleanliness of the fuel according to its application by removing various impurities, such as dust, hydrocarbons, halides, heavy metals, and sulfur compounds.

### Specifications:

- (1) Specifications of the plant.
  - a) Gas throughput, 200 m<sup>3</sup>N/h.
  - b) Operation pressure, -1.0 - 50.0 kPaG.
  - c) Operation temperature, primary processes, 120-160 °C, secondary processes, 120-450 °C.
  - d) Raw gas sources: "Carbonizing gasifier" and simulated fuel gas produced in the facility.
  - e) Target impurities: dust, tar, mercury, halides, and sulfur compounds.
- (2) Primary processes.

Pre-coated type bag filters for dust, halides, and tar with higher boiling point.
- (3) Secondary processes.
  - a) Mercury removal reactor with fixed bed of activated carbon or copper based sorbent.
  - b) Combined reactor with fixed beds of halide sorbent, catalyst, and desulfurization sorbent.
- (4) Analyzer equipments.
  - a) Analyzer for inorganic compounds and hydrocarbons, gas chromatographs equipped with TCD and FID.
  - b) Mercury analyzer.
  - c) Halides analyzer for HCl and HF.
  - d) Sulfur analyzer, gas chromatographs equipped with FPD and SCD.

### Location and Date of Installation:

Yokosuka Campus, July 2006

