

Long-term creep-fatigue test facility in air and in vacuum

Purpose:

Acquisition of high-temperature property data under creep, fatigue and creep-fatigue conditions for the materials used in power plants.

Outlines:

Measure deformation and failure behavior of materials by applying uniaxial tension-compression load to small round-bar specimens heated to high temperatures for the purpose of collecting strength data and developing life evaluation methods. Load is changed mainly by strain control using an extensometer attached to the specimen. Crack growth tests are also conducted for obtaining the data to be used in the assessment of integrity after crack initiation.

Specifications:

[In-air test machines (2)]

- Loading capacity: $\pm 100\text{kN}$ and $\pm 35\text{kN}$
- Heating method: Electric furnace in the air
- Loading mechanism: Electro-mechanical actuator
- Specimen: Round bar ($\phi 8$), CT specimen
- Temperature range: Room temperature, $300 \sim 1000\text{ }^{\circ}\text{C}$
- Control modes: Closed-loop control on load, strain, stroke

[In-vacuum test machine (1)]

- Loading capacity: $\pm 35\text{kN}$
- Heating method: Electric furnace in the vacuum vessel
- Loading mechanism: Electro-mechanical actuator
- Specimen: Round bar ($\phi 8$), CT specimen
- Temperature range: Room temperature, $300 \sim 1000\text{ }^{\circ}\text{C}$
- Control modes: Closed-loop control on load, strain, stroke
- Vacuum level: Below $1 \times 10^{-4}\text{Pa}$ (At room temperature)"

Location and Date of Installation:

Yokosuka Area, September 2007



Total view of Long-term creep-fatigue test facility