

Analysis of Mixture Formation and Combustion Processes in D-4 Engine



To develop the technology that can quantitatively predict and diagnose the in-cylinder air-fuel ratio distribution and combustion process in order to develop an optimal combustion system for high-efficiency direct injection gasoline engines.

Method

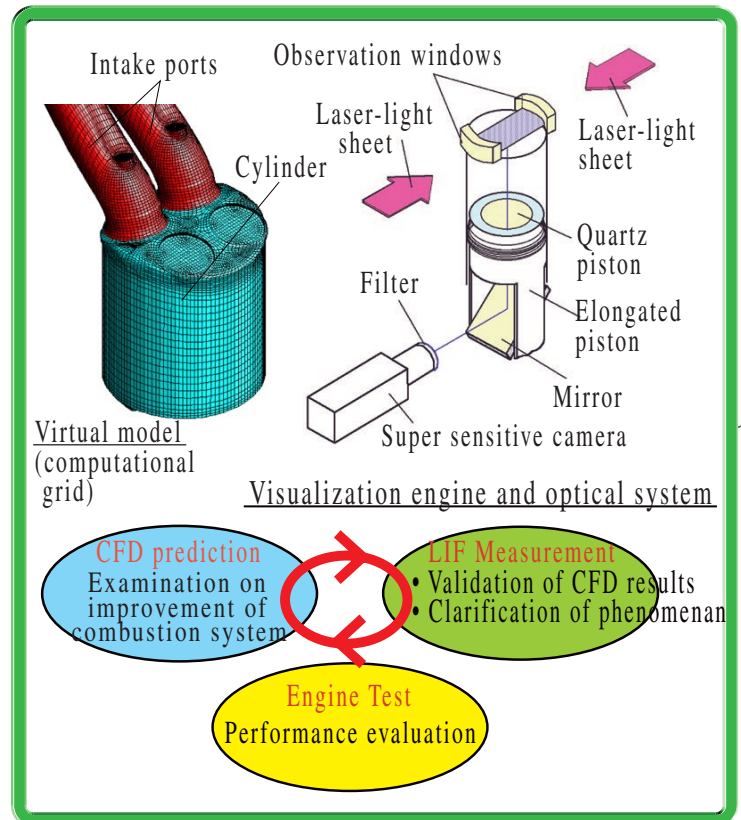
- Prediction technology:**
Computational Fluid Dynamics (CFD)
 Create a virtual model on computer, using fluid dynamics and thermodynamics theories to predict movements of air and fuel.
- Diagnostic technology:**
Laser-induced fluorescence (LIF)
 Excite the fluorescent substance added in the fuel by the laser-light sheet. Analyze the fuel concentration from the LIF intensity.

Characteristics

- The predictions and measurements accuracy is significantly improved by refining the virtual calculation models for CFD and by selecting the suitable fluorescent tracer for LIF.
- Highly sophisticated and efficient engine development can be possible compared with conventional method only by the engine tests. Extensive reduction in development costs.

Application

Development and optimization of combustion system for direct injection gasoline engine (D-4)



A process for developing an optimal combustion system for engines

Analysis results of mixture formation and combustion processes

Combustion system for direct injection gasoline(D-4) engine