모래의 유효 열전도도의 예측모델을 이용한 고온의 유체 열전도도 측정 연구

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A Study on Determination of High Temperature Fluid Thermal Conductivity using a Prediction Model for Sands

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Key Words: Thermal Conductivity Prediction Model (열전도도예측모델), High Temperature Fluid(고온유체), Thermal Conductivity Measurement(열전도도측정).

Abstract : The effective thermal conductivity of silica sands saturated with a fluid was measured at high temperatures using the thermal probe method. The probe method is better because the convection of saturated fluid is limited. From the prediction model for sands, the thermal conductivities of saturating fluids at high temperatures could be determined with the measured values of silica sands saturated with given fluid. The fluid thermal conductivities at high temperatures calculated from the model was shown to agree well with the reference values.

GDI 엔진에서 피스톤 형상에 따른 흡기과급이 실린더 내 연료의 성층화에 미치는 영향

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Effects of Boosted Intake Pressure with Different Piston Cavity Geometry on Stratification of the in-cylinder fuel in a GDI Engine

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Key Words: GDI engine(가솔린 직접분사 기관), Boosted intake pressure(흡기과급), Piston cavity(피스톤 캐비티), Stratification(성층화)

Abstract : The purpose of this study is to investigate the effect of the different boosted intake pressures with various piston cavity geometries on stratification of the in-cylinder fuel in a GDI engine. The spatial distribution of fuel mixtures after impingement of spray against a piston cavity is one of the most important factors for the stratification of the in-cylinder fuel. Three different boosted intake pressures were induced by using a compressor. Two dimensional spray fluorescence images of liquid and vapor phase were acquired to analyze the behavior and distribution of fuel mixture inside cylinder by exciplex fluorescence method. The exciplex system of fluorobenzene / DEMA in non-fluorescing base fuel of hexane was employed. Wall angle of piston cavity were set to 30, 60 and 90 degrees, respectively. The spray impinges on the cavity and diffuses along the cavity wall by its momentum. From present study, it was found that reasonable boosted intake pressure and desirable cavity wall angle with cavity diameter for stratification in a GDI engine demonstrated.