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A Research of the Prototype Fuel Injector for the Aircraft Two-Stroke Opposed-Piston Diesel Engine

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Abstract : The paper presents the research results of the construction of an injector with a modified injection nozzle. The injector is designed for a prototype aircraft opposed-piston diesel engine with an assumed starting power of 100 kW. The injector has been subjected to optical tests carried out in a constant volume chamber with the use of a camera allowing to record images at the frequency of 5400 fps and at the resolution of 1024x1024. The measurements were based on a Mie scattering technique with global lighting. Seven repetitions were made for a specific measurement point. The measuring point was selected on the basis of the analysis of engine operating conditions. The analysis focused on the average range of the spray and its distribution. As a result of the conducted research, the range of the fuel spray was defined for the determined parameters of injection. The obtained results were used to verify and optimize the combustion process in the designed opposed-piston two-stroke diesel engine. Acknowledgment: This work has been realized in the cooperation with The Construction Office of WSK 'PZL-KALISZ' S.A.' and is part of Grant Agreement No. POIR.01.02.00-00-0002/15 financed by the Polish National Centre for Research and Development.

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