

Design of Microwave Cavity for Non-Thermal Plasma Generation

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Abstract

Design of Microwave Resonance Cavity (MRC) to generate non-thermal plasma to treat NO_x and SO_x from marine diesel engine is presented in this paper. Microwave frequency of 2.45GHz is used generate the required plasma. A number of wave guides are used to transfer the microwave energy into to MRC from the microwave source. COMSOL Multiphysics® software is used to model the waveguides and to calculate the electric field pattern in the MRC. Various configurations of microwave discharge are investigated and optimum configuration is considered as the one which gives well spread electric field distribution. Volume of MRC is calculated from the residence time of gas in the MRC and the flow rate of the exhaust gas. This study is a part of the FP7 European project called DEECON (Innovative After-Treatment System for Marine Diesel Engine Emission Control).