

A way to reduce pollutant emissions through concentrated oxygen intake

Were the intake flow contains oxygen at a high degree of purity, the combustion process is much faster and the maximum temperature reached in this phase is higher, thus reducing soot, Hydrocarbons and NOx production (as well as BSFC, Brake Specific Fuel Consumption).

This project proposes an innovative way to reduce the NOx emissions of a Diesel engine close to zero. The idea is to filter the airflow entering the engine so as to introduce almost only oxygen in the combustion chamber. In order to do this, several methods were considered, paying attention to the power balance and space available in the engine compartment using technology available up to now in other fields. The major problem to which no one has found an answer is how to prevent nitrogen getting

into the combustion chamber. In the experiments, the oxygen was stored in some cylinders, but this is not feasible in a road vehicle because of lack of space, weight and safety issues. The idea is to put an air filter in which the molecules of nitrogen are trapped and only the oxygen can go into the engine, thus avoiding unwanted products such as nitrogen oxides (NOx).

The project focused on the technology available in the industrial field to obtain pure oxygen (zeolite filters, ceramic and electrochemical membranes). These applications give different absorption of power and purity of oxygen, so the project took all of them into account. The financial feasibility was not considered due to lack of time and competence in this field •

