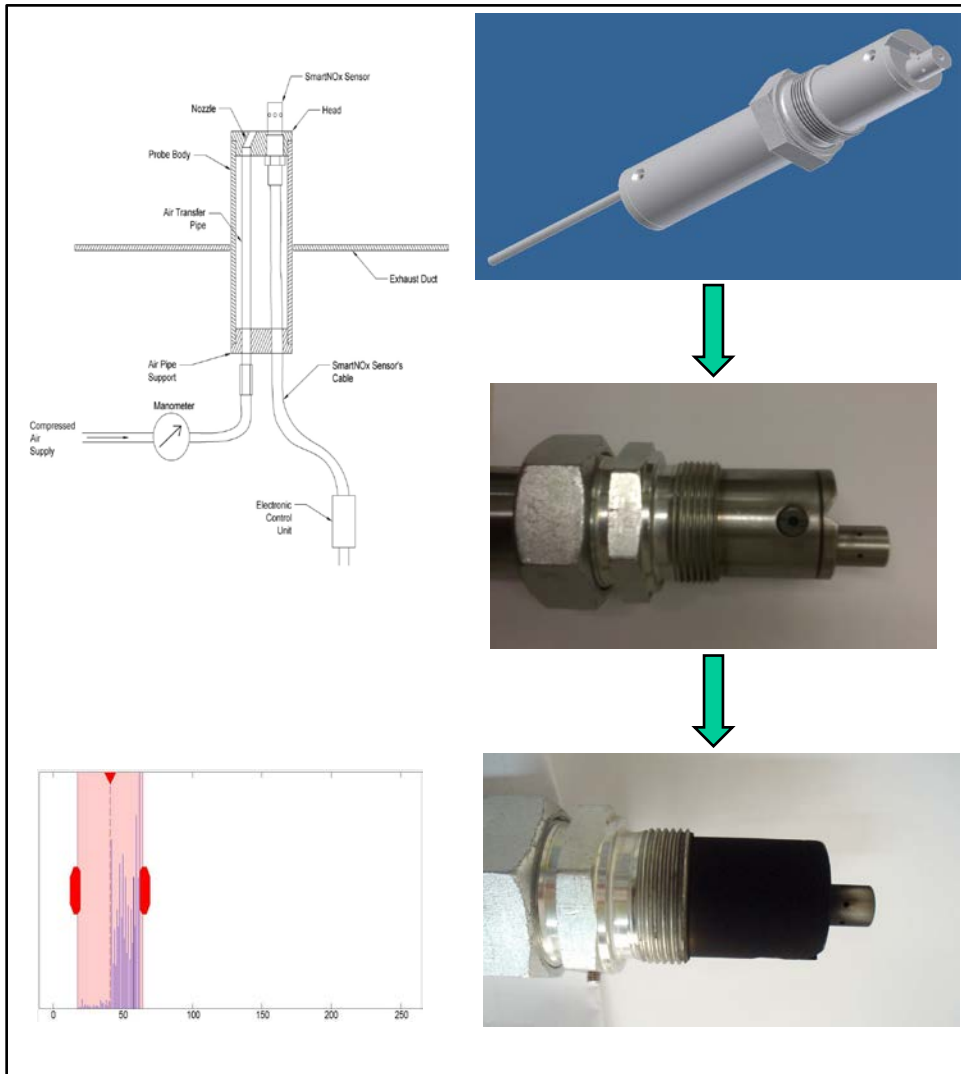


DESIGN AND EXPERIMENTAL STUDY OF AN AIR CURTAIN ARRANGEMENT FOR PROTECTION FROM SOOT LOADING OF A SOLID STATE NO_x SENSOR PERMANENTLY INSTALLED IN THE EXHAUST GAS DUCT OF A DIESEL ENGINE

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This thesis refers to the design and experimental study of an air curtain arrangement that would protect an amperometric NO_x sensor, initially designed for automotive applications, from excessive soot loading. The sensor is purposed to be permanently installed in the engine exhaust duct and it would be protected by the air curtain flow when it does not record measurements. Two types of this arrangement which consisted of a dummy sensor and an air nozzle were tested, for different values of air pressure. The amount of soot deposition was evaluated through processing techniques of dummy sensors' images, in order to define the most effective arrangement. The final structure which consists of the actual NO_x sensor and the selected air nozzle was tested. The sensor readings were compared to simultaneous measurements of a CLD type analyzer, specified by IMO. Moreover, NO_x measurements by the sensor were recorded with the air curtain device switched on, in order to investigate the impact of the arrangement's operation on the sensor's output.

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