

Pegasor Particle Sensor (PPS) Potential solution for On-Board Diagnosis of Particle Filter Operation – First Results and Development Potential

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ABSTRACT

Requirement to install OBD sensor for PM is required by coming EU emission regulations. Not-to-exceed limit values for Euro 6 are fixed in September 2010 and regulation becoming effective 2014. At the moment sensors known to authors being in development are based on non real-time and non continuous operation. Clearly, there is a need for a sensor that will be able to perform measurement of the PM concentration in the exhaust in real-time and possibly both upstream and downstream DPF. Such sensor could assist the manufacturers, serving as an integrated component of the DPF control system.

This paper presents a prototype sensor technology available which can be used in the exhaust line and can be calibrated to measure the concentration of the mass, surface and number of the exhaust particles.

The sensor operates on the escaping current principle and does not involve contact with the particles, which facilitates its long-lasting performance. It provides a quasi real-time signal with a resolution that can reach 10 Hz...1 kHz. The paper presents the operational principle of the sensor and presents first measurements in the exhaust of several engine types. The sensor signal is compared to laboratory well known and proven aerosol instruments and exhibits high correlation.

Finally, the potential to manufacture the sensor at large series with a reasonable cost is demonstrated.

BIOGRAPHY

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PhD Juha Tikkanen graduated from Tampere University of Technology, Physics Department, Aerosol Physics laboratory, Finland in 1999. He did his PhD on new industrial method to generate functioning nanoparticles for amorphous materials such as preforms for active optical fibers. Juha Tikkanen has more than 14 years of experience in aerosol measurement business. Co-founded businesses so far include Dekati Oy (CEO 1994-2007), Liekki Oy (Now an Nlight Photonics company, CTO 1999-2001), Pegasor Oy (Chairman of the Board, 2008 -) and Tassu ESP Oy (Chairman of the Board 2008 -). Several patents and scientific publications.