

Physical and cell toxicity properties of Euro 6d diesel vehicle particle emissions with and without DPF regeneration

Tsakonas, G., ¹ Stamatiou, R., ² Vouitsis, I., ¹ Sainidis, C., ¹ Juárez Facio A.T., ³ Introna M., ³ Steimer S.S.,
³ Elihn K., ³ Lazou, A. ² and Samaras, Z. ¹

¹Laboratory of Applied Thermodynamics, Aristotle University, Thessaloniki, Greece.

²Laboratory of Animal Physiology, School of Biology, Aristotle University, Thessaloniki, Greece.

³Department of Environmental Science, Stockholm University, 10691, Stockholm, Sweden)

geortsak@auth.gr

Despite infrequent and short-lasting occurrences, Diesel Particle Filter (DPF) regenerations can significantly influence particle emissions from Euro 6d diesel vehicles [1,2]. This study explores the physical characteristics and toxic effects of particle emissions under Real Driving Emissions (RDE) conditions, shedding light on factors crucial for legislative considerations. Our specific objectives were to assess DPF regeneration frequency and duration and investigate its impact on particulate number (PN) emissions, size distribution and nanoparticle levels along with their toxicological effects. By testing a Euro 6d diesel vehicle on a chassis dyno, including DPF regeneration, we could measure particle emission properties, cytotoxicity, cell viability and stress induction in a cellular model using the Air Liquid Interface method. Results reveal a significant impact of DPF regeneration, with over 95% of the total particle number produced during regeneration events. Preliminary analysis indicates a decrease in cell viability due to regeneration particles.

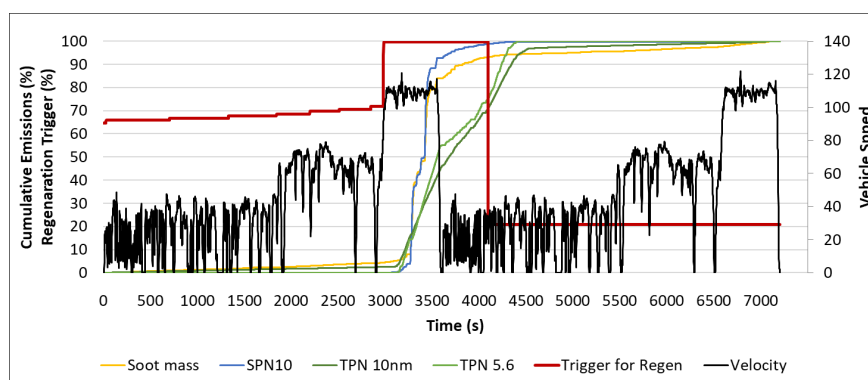


Figure 1 Cumulative particle emissions during regeneration event.

SPN: Solid Particle Number, TPN: Total (solid and volatile) Particle Number

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