

Particle number emissions from a Euro 6d-temp GDI under extreme European temperature and driving conditions

J. Andersson¹, B. Giechaskiel², A. Kontses³, A. Balazs⁴, Z. Samaras³

¹Ricardo Automotive and Industrial, Shoreham-by-Sea, UK, ²JRC, Ispra, Italy, ³LAT, Thessaloniki, Greece, ⁴FEV, Aachen, Germany

With the introduction of gasoline particulate filters (GPFs) the particle number (PN) emissions of gasoline direct injection (GDI) vehicles are below the European regulatory limit of 6×10^{11} p/km under certification conditions. Nevertheless, when considering more robust legislation for light-duty vehicles at Euro 7, concerns have been raised regarding the emission levels at the boundaries of ambient and driving conditions of the real-driving emissions (RDE) regulation. A Euro 6d-Temp GDI vehicle with GPF was tested on the road and in the laboratory with cycles simulating urban congested traffic, dynamic driving, and uphill driving towing a trailer at 85% of the maximum payload. The ambient temperatures covered a range from -30°C up to +50°C. The solid PN emissions were ten times lower than the current PN limit under most conditions and temperatures. Only dynamic driving that passively regenerated the filter, and the cycle after, resulted in relatively high emissions, but still below the limit. The results of this study confirm the effectiveness of GPFs in controlling PN emissions under a wide range of conditions. Related analysis of late Euro 6 diesel vehicles indicates continued effectiveness of DPFs irrespective of boundary conditions. Potential limit values, proposed by the CLOVE Consortium, for PN emissions of light-duty vehicles at Euro 7 will be presented.