Emissions measurement

Regulatory activity surrounding solid particle number has become one of the more difficult challenges for engine and vehicle manufacturers today

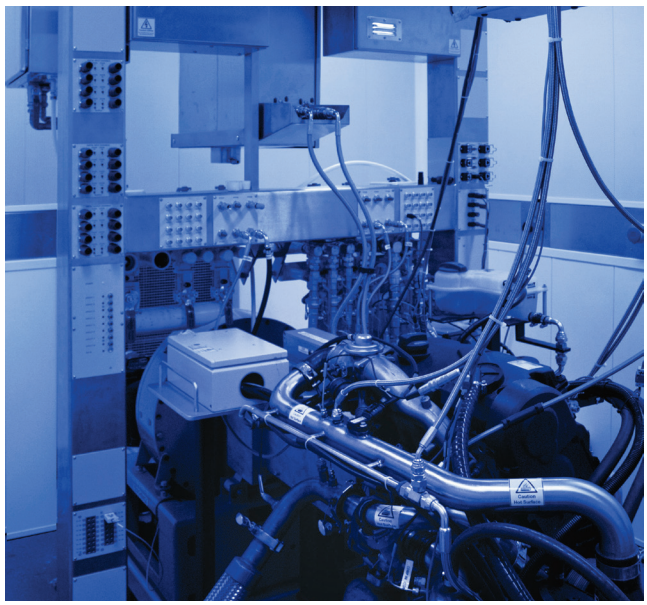
Sierra and Southwest Research Institute (SwRI) have entered into an agreement to commercialize and produce SwRI's fully ECE R49-compliant particle number dilution system.

The Solid Particle Number System (SPNS) is claimed to be the only patented (US 6,796,165) R49-compliant PN certification-grade system on the market. The Sierra SPNS Elite will initially be offered in two versions as a fully compliant >23nm PN system. A sub-23nm version will be introduced next year.

Real-time particle number (PN) measurement enables increased regulatory focus on the employment of the best available technology in diesel particulate filters (DPF) and gasoline particulate filters (GPF) to minimize human exposure to exhaust particles. While previous regulatory activity has focused on solid particles greater than 23nm, activity through research projects such as DownToTen has focused on the viability and value of PN regulation down to 10nm.

The SPNS represents more than 10 years of research and development by SwRI. The two-stage dilution scheme in SPNS has enabled ECE-R49, Swiss, Euro 6, EU engine and vehicle PN certifications, and is fully compliant per SAE Air 6241 specifications for aircraft turbine PN quantification down to 15nm. Sierra will repackage and market the SPNS system, develop new software and manufacture all versions at its Lansing, Michigan, facilities.

Initial SPNS versions offered will include a standalone version for full-flow CVS units and other non-Sierra partial flow dilution devices. The second version is paired with the Sierra BG3 transient partial flow system for both new and upgraded existing BG3 systems, using data analysis and output, vacuum and dilution air filtration resources from BG3.



Manufacturers and researchers of automobiles, diesel engines, turbines, exhaust aftertreatment systems, motorcycles and mopeds are affected by the new regulations

Of late, researchers that have been focused on future sub-23nm PN quantification have 'discovered' the virtues of the radial inflow porous diluters relative to particle loss mitigation, specifically from thermophoretic deposition.

Sierra BG series partial flow dilution systems have uniquely relied on the outstanding performance of radial inflow porous diluters since Sierra introduced them to the market in 1993, in partnership with Caterpillar.

Both SPNS versions will accommodate up to two particle counters for simultaneous sub-23 and +23nm PN measurement. Furthermore, the patented BG3 auxiliary flow feature allows real-time extracted sample flow-rate data acquisition from the SPNS and recalculates internal dilution ratio and actual raw exhaust accumulated flow values, both real-time and cycle-integrated for simultaneous ECE R49, 40CFR Part 1065 and 1066, etc., and PM sampling. A second heated catalyst located post-CPC largely eliminates personnel exposure to butanol fumes.

See a demonstration of the Sierra SPNS Elite at Automotive Testing Expo Novi, Michigan, Booth 1006. ❮