

Burner-based Aftertreatment Aging with the Cambustion DPG



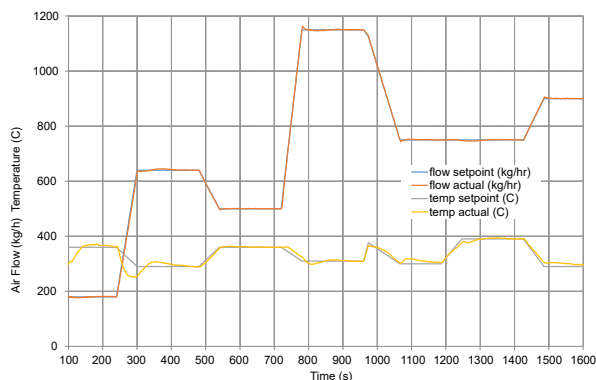
Aftertreatment Aging to 40 CFR 1065 and DAAAC

DAAAC Accelerated Aftertreatment Aging

Heavy duty emissions legislation requires demonstration of compliance out to a long full useful life. The DAAAC Protocol provides a methodology for developing accelerated cycles to give equivalent aftertreatment system degradation to the full real-world lifetime with reduced duration and cost.

DAAAC derived cycles can be run on an engine, but this needs modifications to the engine to achieve the accelerated cycle conditions and requires an expensive dynamometer facility. Alternatively, the cycle can be reproduced on a test stand such as the Cambustion DPG. This reduces cost, avoids long-term commitment of valuable engine test benches, and improves reliability and reproducibility.

Example DAAAC Cycle on DPG



Federal Regulation 40 CFR part 1065.1143 specifies requirements for test stands to reproduce aging cycles: Cambustion has enhanced the the DPG so it can now be configured to meet these requirements.

Cambustion DPG - an Industry Standard

The Cambustion DPG is a trusted system for testing of Diesel and Gasoline aftertreatment systems and components. It has been in use for over 15 years in OEM and Tier 1 production and R&D facilities around the world for DPF and GPF testing. The DPG automates performance and durability testing of exhaust filters and catalysts, at lower cost and improved repeatability than engine testing.

The DPG is based on a Diesel fuelled burner generating real-world engine flows and temperatures and realistic or accelerated soot rates. It is a customisable system: additional modules allow generation of ash, NO_x, and other poisons and control of O₂ and H₂O concentration.

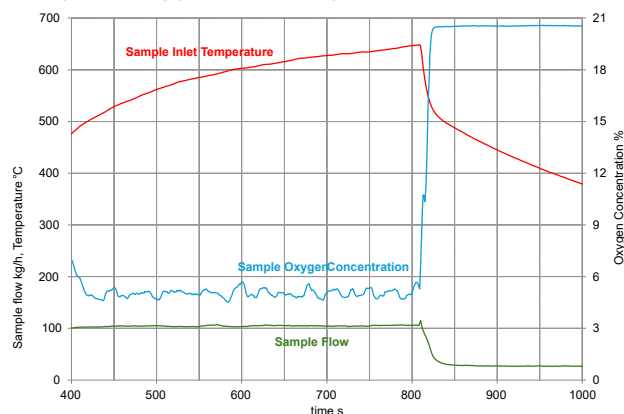
The DPG is controlled by flexible software which allows configuration of complex test cycles for long-term unattended operation. Cycles can include steady-state operation and the simulation of transient dynamics such as active regeneration and drop-to-idle events. Long duration durability or aging cycles can include periodic automated performance evaluation, for example for catalyst effectiveness or filtration efficiency, without the need to de-mount the sample and test elsewhere.

DPG Compliance with 40 CFR 1065

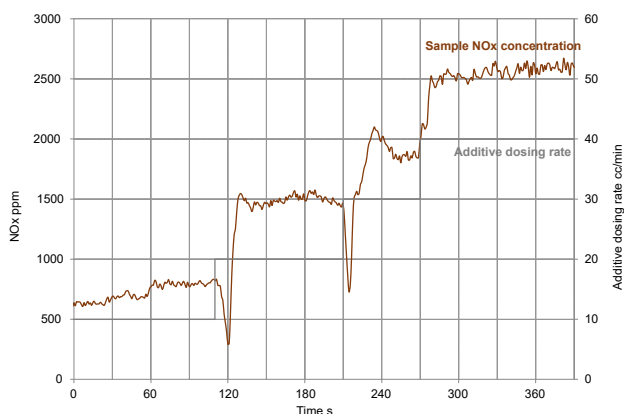
The Cambustion DPG meets the specified requirements for aging stands:

- Diesel fuel based sample gas generation
- Full-scale exhaust flow and temperature
- Ash, sulphur and NO_x generation
- Oxygen and water concentration control
- Transient and steady-state operation
- Long-duration, unattended testing.

DPG Dynamic Oxygen Control - Regeneration Simulation



Controlled NO_x Generation

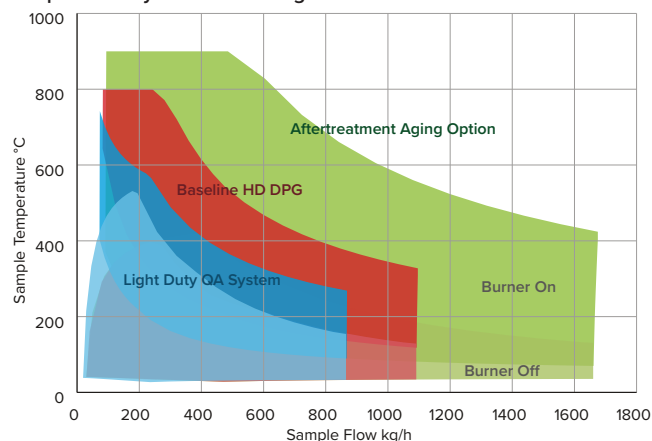


A Flexible System

The DPG system has a wide range of test capabilities beyond aftertreatment aging. The system can be configured for testing parts from light duty up to heavy duty sizes.

In addition to gaseous constituents, the DPG offers representative or accelerated soot generation.

Example DPG System Flow Ranges



Instrumentation for particle number or particle mass based filtration efficiency and sample gas composition can be integrated into the DPG and its control software.

Testing capabilities of the DPG include:

- Exhaust filter soot capacity and backpressure
- Diesel Particle Filter thermal shock resistance and durability
- Catalytic activity testing
- Filtration efficiency testing
- Filter ash loading.

Therefore the same DPG system can be used for aging according to legislated protocols and proprietary aging cycles, and for other R&D and QA tests.

Installation requirements for a DPG system are much simpler than an engine test bench. Cooling air control is built-in and the system will draw fuel direct from a tank or barrel. Integrated toxic gas detection is available.

Along with delivery of DPG systems, Cambustion also offer contract aging and testing services at our facilities, where we also offer engine and vehicle testing.



Cambustion was founded in 1987 in Cambridge, UK and now has customers in more than 35 countries worldwide.

Cambustion continues to research and develop novel instrumentation and offer measurement consultancy; helping our global clients to solve a wide range of particle and gas measurement issues.



To learn more, visit:

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