# Sub-scale and oxygen control accessories

The Subscale and Oxygen Control Systems are supplementary systems to the DPG which allow tests on DPFs and GPFs to be run over a range of additional conditions.

Subscale System

The subscale system allows small particulate filters, especially subscale samples, to be tested at much lower flows than the normal DPG minimum flow, typically in ranges from 0.5 - 20 kg/h to 5 - 100 kg/h. This eliminates issues with comparability of test results when scaling up from laboratory prototypes to full-size filters.

Canning options for cylindrical or square-section subscale parts:
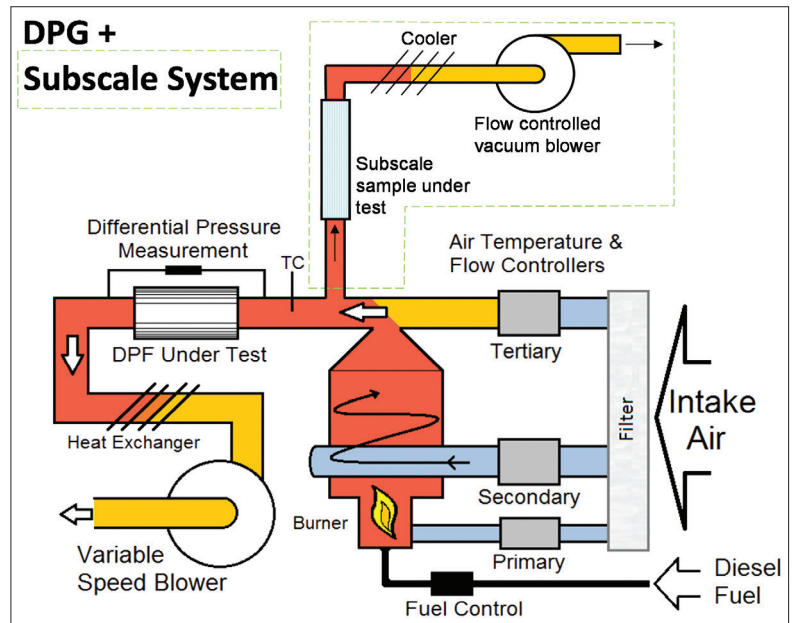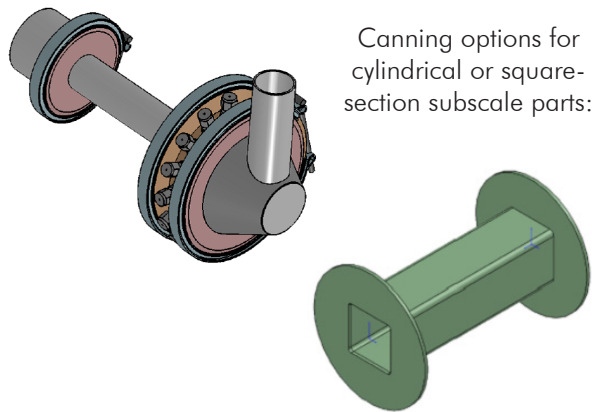
The full range of tests: loading, filtration, regeneration and flow testing can be run on the subscale parts.

The subscale flow system also improves the capability in testing full-scale particulate filters. Firstly, by running the subscale system at constant flow, the minimum filter flow rate is reduced. Secondly, by varying the subscale flow during a test, the flow through the filter can be changed without any effect on the temperature or other burner conditions. This particularly improves the capability of drop-to-idle simulations.

Oxygen Control System

The fuel consumption of the DPG is significantly lower than an engine at similar exhaust flow & temperature conditions. As a result, the exhaust oxygen concentration is typically higher. In most applications, this is not a problem, but in cases where the rate of regeneration of a filter is limited by the availability of oxygen, it prevents the DPG running at conditions representative of the engine.

The oxygen control system reduces the oxygen concentration in the test section flow by recirculating some of the DPG exhaust into the inlet.

The recirculation is controlled to achieve the desired oxygen concentration in the particulate filter inlet as measured by a standard UEGO / Lambda sensor. Generally oxygen concentration levels of between 2.5% and 4% can be achieved, depending on the system operating point.

The oxygen control system can be fitted and used with or without the subscale test system.