



# AIR CLEANER

Since the end of September, one of the Euro VI diesel-powered single-deckers running out of Go-Ahead's Bluestar Eastleigh (Southampton) depot has been carrying a 600mm-high backpack. This 25kg proof-of-concept unit consists of filter media and an electric fan to pull particulate matter, PM, out of the air and trap it on the filter, which is said to catch 99.5% of particles up to 10 micron in size.

The goal is to drive a message that buses are a solution to traffic congestion in cities, and can be the solution to the air quality problem there, too, says Jim Collins, Go-Ahead Group chief engineer (bus). He adds: "Buses have got a quite bad reputation. What we are trying to do, if we can, is to turn that reputation slightly."

A hazard to health, fine dust particulate matter is generated by brakes, tyres and engines of all vehicles – not just buses. And Southampton was one of five cities (with Birmingham, Leeds, Nottingham and Derby) charged by the government in 2015 to develop some of the first of the new air quality measures.

Of course the six-cylinder Euro VI

**Go-Ahead has developed, and is now trialling, what may be the first prototype of a filter for urban air. Will Dalrymple reports**

Cummins diesel powering the 66-plate Enviro 200 MMC single-decker bus (pictured) is fitted with a diesel particulate filter. Post-DPF, its PM output works out as 0.0075g/km, or in annual terms about 0.5kg per bus, on average, based on a typical Southampton route.

In comparison, a successful outcome for the three-month trial would be to trap the equivalent of 6-8kg/year of PM. If the filter works as expected, that's the amount that would be filtered from a column of air 20m wide along the entire length of route 18, 1.7 times a year.

## HOW IT WORKS

The fan is automatic in operation, and is said to have negligible power drain on the engine, though that, as well as the exact filter performance in service, remains to be confirmed by the trial.

Filter media comes from Pall, a

Portsmouth-based filter manufacturer, whose main business is in aerospace, providing units for commercial aviation. The collaboration began in September 2017, following a chance discussion between engineers at a trade conference. The first step was a £40,000 paper-based feasibility exercise; that led to development of a £30,000 prototype. This is thought to be the first time Pall filters have been used for urban air filtration. As of October 2018, the first few weekly pressure-drop tests confirmed that the filters are working, though those results are preliminary.

Go-Ahead, whose Southampton fleet alone consists of 75 buses, is aiming for running costs of the system to amount to hundreds of pounds per year, for a single annual filter change.

If the project goes well, the bus operator has big plans. It might look to increase the size of the filter for greater throughput, power the fan with a solar panel, or route the filtered air inside the bus (so the interior could be said to be cleaner than outside). It may also fit out other fleets, such as for example its 50 full-electric buses in London. [TE](#)