

## Real-World PM, PN and NO<sub>x</sub> Emission Differences among DOC+CDPF Retrofit Diesel-, Diesel- And Natural Gas-Fueled Bus

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**Abstract :** To reflect the effects of different emission control strategies, such as retrofitting after-treatment system and replacing with natural gas-fueled vehicles, on particle number (PN), particle mass (PM) and nitrogen oxides (NO<sub>x</sub>) emissions emitted by urban bus, a portable emission measurement system (PEMS) was employed herein to conduct real-world driving emission measurements on a diesel oxidation catalytic converter (DOC) and catalyzed diesel particulate filter (CDPF) retrofitting China IV diesel bus, a China IV diesel bus, and a China V natural gas bus. The results show that both tested diesel buses possess markedly advantages in NO<sub>x</sub> emission control when compared to the lean-burn natural gas bus equipped without any NO<sub>x</sub> after-treatment system. As to PN and PM, only the DOC+CDPF retrofitting diesel bus exhibits enormous benefits on emission control relate to the natural gas bus, especially the normal diesel bus. Meanwhile, the differences in PM and PN emissions between retrofitted and normal diesel buses generally increase with the increase in vehicle-specific power (VSP). Furthermore, the differences in PM emissions, especially those in the higher VSP ranges, are more significant than those in PN. In addition, the maximum peak PN particle size (32 nm) of the retrofitted diesel bus was significantly lower than that of the normal diesel bus (100 nm). These phenomena indicate that the CDPF retrofitting can effectively reduce diesel bus exhaust particle emissions, especially those with large particle sizes.

**Keywords :** CDPF, diesel, natural gas, real-world emissions

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