PM Measurement with Partial Dilution Tunnel
- Influence of Sampling Line on PM Measurement -

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Full-flow dilution tunnel (hereinafter referred to as "full tunnel") measurement method has become de facto standard for the evaluation of Particulate Matter (hereinafter referred to as PM) emitted from diesel cars. However, due to its drawbacks such as bulkiness and expensiveness, a method that uses very small partial dilution tunnel (hereinafter referred to as micro tunnel) has been developed mainly in Europe and it's almost at the level of practical use. With this method, higher degree of freedom in controlling sampling flow and temperature can be obtained. Another advantage of micro tunnel is that the system is compact.

However, a large part of its measurement accuracy still remains uncertain because the accumulation of measurement data is not yet sufficient. Measuring PM with various parameters of micro tunnel made a research on its equivalency with full tunnel. Although no errors were found in sampling flow rate and dilution ratio control, its values were observed with some bias errors. This tendency has been reported from researches in many other laboratories, too. It can be speculated as due to the longer sampling line of micro tunnel in proportion to the tunnel itself and the impact of temperature control on the composition of PM. On this basis, a sampling line system was modified for further measurement. The influence of sampling line system on its equivalency was shown very clearly from the measurement result and its analysis.