

Extended Poster-Abstract

Experiences with cleaning of CVS dilution tunnel

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During many years of use deposits are collected on the walls of CVS dilution tunnel. Questions arise, if and how these deposits influence the changes of nanoparticles measured at the end of tunnel.

During the study projects of AFHB (Laboratories of IC-Engines and Exhaust Emission Control) of the UAS Bern, TI Biel-Bienne, several tests were performed with a Diesel passenger car before and after cleaning of the tunnel. The nanoparticles were measured with SMPS at different sampling positions (SP). Additionally to the measurements of diluted exhaust gas there were also measurements of dilution air sucked through the tunnel by the CVS blower (with closed exhaust gas inlet to the tunnel)

The poster shows some examples of results.

The most important conclusions are:

- the aerosol concentration in the filtered dilution air decreased after cleaning. This is may be due to less particle release from the tunnel wall,
- the cleaning of CVS dilution tunnel does not influence significantly the aerosol concentration, or the measured influences are much smaller than the dispersion of emissions source and/or measuring system,
- we observe a bigger dispersion of the nanoparticle emissions at 20 km/h because of the difficulty to keep the speed of the car constant.

Summarizing:

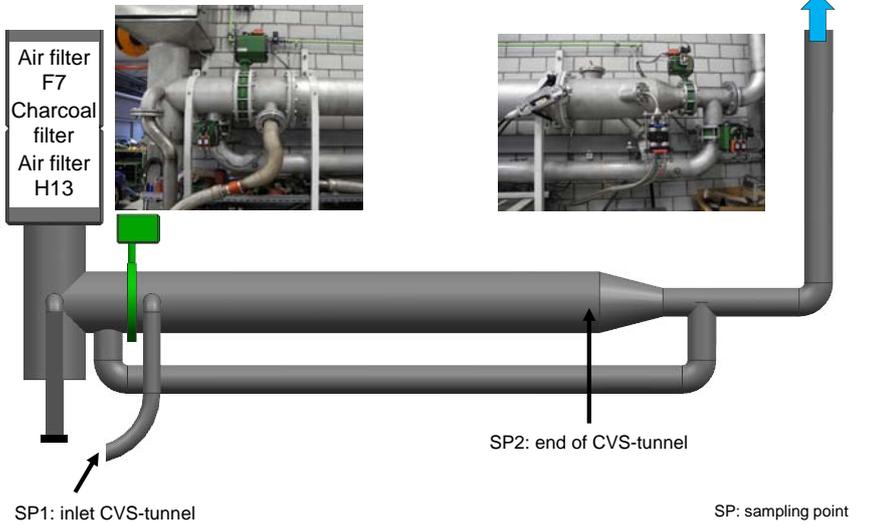
Theoretically the possible influences of deposits in the dilution tunnel on the processes, like store-release, thermophoresis, absorption, or desorption of precursor substances etc. cannot be denied.

Practically the influences of deposits are in or below of the range of magnitude of emitting- and measuring dispersion.

Experiences with cleaning of CVS dilution tunnel

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CVS-tunnel



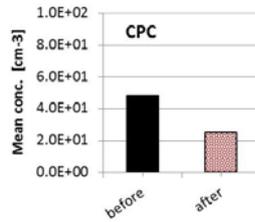
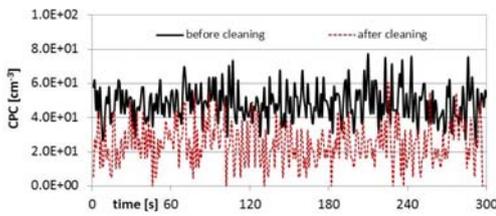
Pictures of CVS-tunnel before and after cleaning



Results

Filtered dilution air in CVS-tunnel

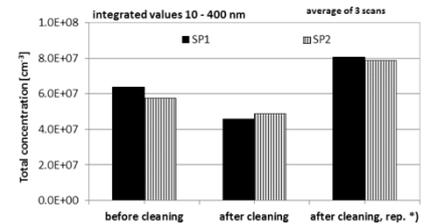
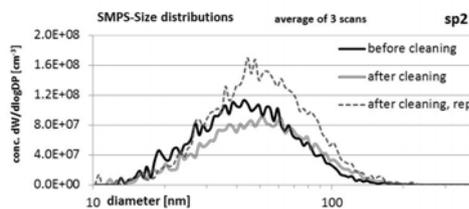
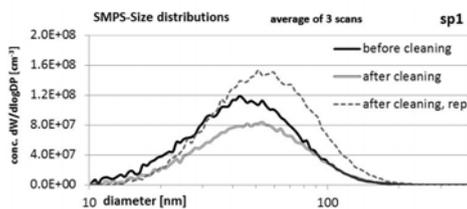
Measured at SP2, with inlet closed, measured with CPC TSI 3772



Conclusions

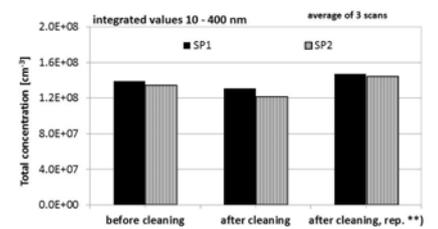
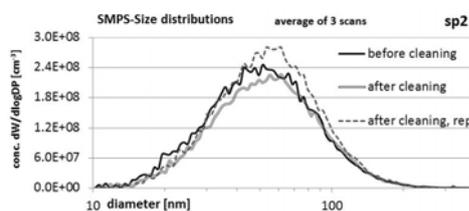
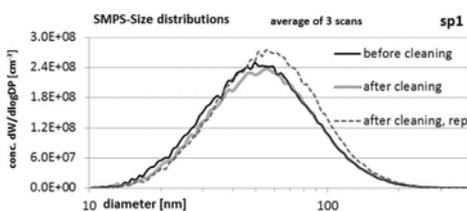
- the aerosol concentration in the filtered dilution air decrease after cleaning. This is may be due to less particle release from the tunnel wall,
- the cleaning of CVS dilution tunnel does not influence significantly the aerosol concentration, or the measured influences are much smaller than the dispersion of emission source and / or measuring system,
- we observe a bigger dispersion of the nanoparticle emissions at 20 km/h because of the difficulty to keep the speed of the car constant.

SP1 and SP2 with diesel car w/o DPF at constant speed = 20 km/h.



*) ... repetition with the same vehicle after 33 days

SP1 and SP2 with diesel car w/o DPF at constant speed = 80 km/h.



***) ... repetition with the same vehicle after 7 days