Informal document GRPE-68-21
(68th GRPE, 7-10 January 2014, agenda item 7)

Sub<23 nm Particles Key Messages

Document discussed in the PMP meeting 08 Jan 2014

Overview

- Particles < 23nm are partially measured today
- The system today works well and is applied across the industry
  - Light duty
  - Heavy duty
  - Extension to NRMM underway

Particle size / composition

- Existing technologies (eg GDI) do not have significantly smaller particle size range than diesels with DPF

- Some particles < 23nm on GDI sometimes identified but only at certain specific conditions. The percentage not measured is typically <60% (on average 30-40%) and comparable to diesels (<20%)

- We do not know what these particles are – physically or chemically – more work required

Measurement Equipment - PNC

- PNC could be adapted to measure particle size down to 10nm
- Current PNC could NOT be adjusted to measure below 10nm. Different model is necessary. It is not as simple as plug and play.

Measurement Equipment - VPR

- VPR Evaluated as not robust to measure down to either 10 or 3 nm today (volatile artifacts are common)
- Alternative could be catalytic stripper
- Catalytic stripper has also some issues to overcome
- Calibration of VPR and determination of transfer functions / losses will be a further issue
- Uncertainty of measurement expected to increase when solid sub-23nm particles exist.

Calibration

- ENV-02 recommended ‘not a soot like aerosol’ for calibration – but has not suggested what should be done instead.
- Calibration significant challenges for reference CPC (would need to be calibrated to lower particle size). Potentially all calibration to be done by electrometer – fundamental

Recommendations / Next Steps

- No urgent need identified to revise measurement to < 23nm today.
- New / emerging technologies to be kept under review regarding <23nm particles.
- EU Com requested PMP to continue to develop a robust < 23nm method in case of future need.
  - PMP will develop a plan and timeline
- Guidelines to avoid artefacts to be developed when measuring <23nm particles
- With the above recommendations, the work on regeneration measurements for LD vehicles can start.