

Joint Research Centre (JRC)

PMP VPR Round Robin:
Status

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- **Starting from September 2011 all new type approved diesel vehicles need to comply with a particle number limit of 6×10^{11} #/km [Directive 692/2008].**
- **Currently Volatile Particle Removers (VPRs) are calibrated by each instrument manufacturer individually following some very basic guidelines specified in the regulation [UNECE Reg. 83].**
- **Do all manufacturers measure the same thing?**

- **Golden VPR: Dekati Dual Ejector (JRC)**
 - Calibration is challenging due to:
 - The sensitivity of the dilution ratios on the operating (mainly inlet) pressures → 3 kPa inlet under-pressure requirement monitored with a “golden” pressure transducer.
 - High operating flowrates → conditioning of the dilution air challenging (background $\sim 1\#/\text{cm}^3$)
- **Golden Aerosol Generator: PALAS DNP3000 graphite generator (JRC)**
 - Alternative to established generators in participating labs (mainly CAST and salt)
- **Golden CPC: TSI 3790 kindly provided by TSI**
 - Large cut-off size → Interference in the determination of the PCRF values?

- **Measurement of dilution ratio using a trace gas**
- **PCRF measurements at 30, 50 and 100 nm:**
 - Golden Aerosol Generator (at defined operating parameters) and two CPCs (Golden and a second one also operating at 1 lpm)
 - Alternative Aerosol Generator
- **Optionally:**
 - Linearity checks of all CPCs employed
 - PCRF measurement at 15 nm

Lab	Date	Data	Investigations
JRC	08/10	Ok	Test protocol definition, Golden CPC calibration
Golden CPC malfunction during shipment (butanol fill electro-valve)			
LAT	10/10	Ok	Thermally treated diesel exhaust
AVL	01/11	Ok	CAST, mini-CAST
HORIBA	02/11	Ok	NaCl, CAST, tests without neutralizer
EMPA	04/11	Ok	NaCl, Paladium, 2xTSI3790 vs 2TSIx3022, polydisperse checks, DMA vs TDMA
MATTER	05/11	No	CAST, PCRF at 15 nm, multiply charge determination
NPL	09/11	Ok	Sheath/Sample ratio effect, CPC calibration
AEAT	10/11	No	CAST
Golden CPC malfunction			
VW	-		
MAHA	-		

Thank you for you attention!

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NPL, AEAT**