



UNITED NATIONS

73rd UNECE GRPE session

PMP IWG Progress Report

Joint Research Centre
the European Commission's
in-house science service

 JRC Science Hub: ec.europa.eu/jrc

Current status

- The PMP IWG worked from June 2013 (approval date of the previous ToR) up to June 2016 on a number of issues related to both exhaust and non-exhaust particles
- Main investigations:
 - Sub-23 nm exhaust particles: Nature, number, measurement feasibility
 - Non-exhaust particles: Literature survey and collection of information on test cycles, on-going projects, sampling/measurement methodologies
- All the information collected are available on the UNECE website / PMP webpage

Key messages

- **Brake wear particles:**
 - Industry is very active in researching/developing low emission brake systems – Consensus on the usefulness of a common measurement procedure
- **Particles from tyre/road wear:**
 - Ultrafine particles generated only under extreme conditions - Many questions still open. Distinguishing the different sources (tyres/road/material deposited on the road) is a challenge

New mandate / ToR

- The PMP group submitted to GRPE an updated draft version of the ToR and requested a new mandate with two new specific concrete objectives:
- Sub 23 nm exhaust particles:
 - Demonstrate the feasibility to measure sub23nm particles with the existing PMP methodology with appropriate modifications and assess measurement differences/uncertainties by means of a round robin
- Brake wear particles:
 - Development of a suggested common test procedure for sampling and assessing brake wear particles both in terms of mass and number

NON-EXHAUST PARTICLE EMISSIONS

Steps for Building a Common Method for Measuring Brake Wear Particles

Development of a suggested common method for BW particle investigation – Steps

- Adoption/Development of an appropriate Braking Test Cycle
- Selection of the most suitable methodology for BW Particles Sampling
- Selection of the most suitable methodology for BW Particles Measurement and Characterization

Step 1 - Adoption/development of a braking test cycle

- ✓ WLTP Database Analysis (Concluded)
- ✓ Comparison of WLTP data with Existing Industrial Cycles (Deadline: January 2017)
- ✓ Development of a first version of a New Braking Cycle if necessary (Definition of the nature of the cycle – urban or mixed - duration of the cycle, number of repetitions required, preconditioning, etc.) (Deadline: June 2017)
- ✓ Testing and Validation of the New Cycle - Possible round robin (Deadline: To be defined depending on the progress)

Step 2 - Selection of the most suitable sampling method

- ✓ Comparison of existing systems/test rig configurations (i.e. open vs. closed, sampling box vs. hose) (Deadline: June 2017)
- ✓ Selection of Functional Parameters (i.e. Temperature Tolerance, Inertial Load, Speed Variation, etc.) (Deadline: June 2017)
- ✓ Selection of Testing Parameters (i.e. Temperature, RH, Load, direction of cooling air, etc.)
- ✓ Testing and Validation of the Selected Configuration (Deadline: To be defined depending on the progress)

STEP 3 - Selection of the most suitable methodology for BW Particles Measurement and Characterization

- ✓ Comparison of Existing Methodologies (Deadline: January 2017)
- ✓ Selection/decision on the parameters/metrics to be considered (i.e. both mass and number)
- ✓ Selection of the most suitable methodologies based on the selected sampling configuration (Deadline: To be defined depending on the progress)
- ✓ Testing and Validation of the Selected Methodologies (Deadline: To be defined depending on the progress)
- ✓ Data processing method (Deadline: To be defined)

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