

# PMP – Particle Measurement Program Informal Working Group

## Task Force 2– Brake Dust Sampling and Measurement

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**Meeting #10 – Thursday 22 March, 2018, 14:00 – 15:00**

### **Minutes of Meeting – Final Version**

**1. Tour de table:** Participants: AUDI-(SG) Sebastian Gramstat; AVL-(TM) Thanasis Mamakos; BREMBO-(MA) Mattia Alemani; BREMBO-(FR) Francesco Riccobono; CARB-(SC) Sonya Collier; DEKATI-(MMD) Mikko Moisio; FEDERAL MOGUL-(MM) Marcus Morbach; GM-(MR) Matt Robere; Horiba-(DL) Dmytro Lugovyy; ITT Motion-(AS) Agusti Sin; JARI-(HH) Hiro Hagino; JRC-(TG) Theodoros Grigoratos; LINK-(RM) Radek Markiewicz; TMD Friction-(IP) Ilja Plenne; TSI-(SP) Stephan Percot; TU Ilmenau-(DH) David Hesse; TU Ilmenau-(TF) Toni Feissel; TU Ostrava-(MV) Michal Vojtsek.

**2. Structure of the work – Management of the Work:** TG presented the current version of the structure of the work document with the aim of collecting comments/feedback and finalizing it. This version will serve as a starting point and will be adjusted based on the development of the work. The current version of the document is attached to the MoM. The current version of the document comprise of 9 items.

Item No 1: “Introduction, rationale, and scope”. This item has been already concluded with contribution from all partners (reference to the definition of the scope).

Item No 2: “Nomenclature, definitions, and terminology”. For Aerosols and Particles there are international norms which will be applied/taken under consideration. There is a question regarding the definition of brake PN which should be adjusted on our scope.

Action: JRC, CARB and NA SAE (CA and MR) will collect information and prepare the chapter. International norms (ISO) and EN standards will be applied/taken under consideration. Contribution from other members is more than welcomed.

Item No 3: “Brake dynamometer capabilities”. Clarification on the fixture design (universal fixture or/and other types) and orientation of the caliper. Discussion on the point regarding the ventilation system and possible overlap to Chapter 4. Several other technical comments have been included in the text as footnotes and will be evaluated when the technical discussion will take place. TG explained that several overlaps are expected through different chapters and will only be addressed later as the work (and therefore the document) progresses.

Action: Link to prepare a first draft design of the chapter and feedback to be provided from all partners. Data previously collected in the TF2 (document on configurations/set-ups) will also be used as basis.

Item No 4: “Sampling system”. This item will use input from TF1. TF1 work is very closely related to items 4.1 and 4.2. DL suggested substituting the guidelines for duct size, shape, and material with defining cooling efficiency or time for pads/disk cooling rather than duct size and shape (see comment iii). Will be evaluated when the technical discussion will take place. Regarding item 4.4, TM mentioned that sampling system losses can be calculated.

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Two proposals on how to do it (use of some benchmark friction materials or use of other standard materials). Will be evaluated when the technical discussion will take place.

Action: Collection of the data for this item will be handled by JRC in collaboration with TF1. Data and feedback is expected from all partners. JRC will contact group members for related data.

Item No 5: “Brake emissions mass measurement system”. TM proposed to use specifications from exhaust measurements as starting point. There is a consensus that mass will be measured gravimetrically. Several parameters need to be defined in conjunction with Chapters 3 and 4. TG asked the group to provide already available data as well as describe lessons learnt even with cycles not suitable for real world evaluations. TF stated that TU Ilmenau will do so as soon as their on-going evaluation is completed. TG also mentioned that the WLTP based cycle will become available to the group in order to start measurements before the Eurobrake 2018 and face to face PMP Meeting (May 2018). **TG asked for a volunteer to start drafting this chapter – it doesn’t make sense for JRC to take over all chapters as this will result in significant delays.**

Action: A volunteer is required to start drafting this chapter (if possible someone with experience either on brake mass measurements or exhaust mass measurements).

Item No 6: “Brake emissions number measurement system”. Again there is the proposal to use specifications from exhaust measurements as starting point. Several parameters need to be defined in conjunction with Chapters 3 and 4. TG asked the group to provide already available data as well as describe lessons learnt even with cycles not suitable for real world evaluations. **TG asked for a volunteer to start drafting this chapter.**

Action: A volunteer is required to start drafting this chapter (if possible someone with experience either on brake PN measurements or/and exhaust PN measurements).

Item No 7: “System calibration, validation, and sign-off”. TG mentioned that it is premature to discuss this chapter and it is possible that the content will be modified as the work progresses. Several comments have been included in the text as footnotes.

Action: No action is required for the time being.

Item No 8: “Appendixes”. TG mentioned that it is premature to discuss this chapter and it is possible that the content will be modified as the work progresses.

Action: No action is required for the time being.

**3. AOB:** Next meeting to take place on 5 or 12 April.

Action: Please provide feedback on preferred date.