

PMP – Particle Measurement Program Informal Working Group

Task Force 2– Brake Dust Sampling and Measurement

Meeting #25 – Thursday 27 FEBRUARY 14:00 – 15:00

Minutes of Meeting – Final Version

1. Tour de Table: AUDI-(SG) Sebastian GRAMSTAT; AVL-(AP) Alexander PICHLER; BMW-(KK) Katharina KOLBECK; BREMBO-(MF) Matteo FEDERICI; BREMBO-(GP) Guido PERRICONE; CARB-(SC) Sonya COLLIER; CONTI-(AR) Achim REICH; DEKATI-(MM) Mikko MOISIO; DRIV-(MM) Marcus MORBACH; DRIV-(AG) Andreas GIESE; DRIV-(CK) Christoph KOELSCH; Ford-(JG) Jarek GROCHOWICZ; Ford-(MM) Marcel MATHISSEN; GM-(MR) Matt ROBERE; Horiba-(JD) Joel DANZER; Horiba-(DL) Dmytro LUGOVYY; Horiba-(YO) Yoshinori OTSUKI; ITT-(SA) Simone ANSALONI; ITT-(AS) Agusti SIN; JARI-(HH) Hiro HAGINO; JRC-(TG) Theodoros GRIGORATOS; LINK-(CA) Carlos AGUDELO; LINK-(RV) Ravi VEDULA; OPEL-(OB) Olaf BAUSCH; TMD Friction-(AP) Andreas PAULUS; TSI-(JS) Jürgen SPIELVOGEL; TSI-(SP) Stephan PERCOT; TU ILMENAU-(DH) David HESSE.

2. Background concentrations: TG briefly introduced the topic based on the discussions conducted some time ago as well as the input provided by the partners over the last weeks.

CA proposed to consider background check at two levels. Firstly, at a whole system level as an one-off exercise and secondly at a test-to-test basis as a routine check. TG questioned the purpose of the first level check when (and if) the second level background check is available. TG asked whether background check is necessary for each test. It seems that the group considers it an integral part of emissions testing.

JD presented Horiba's views on the topic (presentation attached to the MoM). Firstly, some ideas on how to minimize contamination and leakages were presented (Slide #2). It seems that H13 HEPA filters are efficient enough to remove particles and keep background concentrations to appropriate levels. ***There is a recommendation to define a minimum acceptable filter efficiency as in exhaust measurement.*** JD presented the current approach of Horiba for the background measurement (slide #4). Special attention was drawn to the CPC calibration requirements. The current proposal of Horiba limits the recommendations to solid PN. TG stated that this might be a problem for labs measuring total particle emissions as double instrumentation will be required. There is a consensus among the TF2 members that mass based background measurements are not the optimal solution. An extensive discussion regarding the purpose of measuring solid only background concentrations followed. It seems that the problem might be gaseous organic compounds escaping the HEPA filter and creating nanoparticles within the measurement system. ***TG asked if the installation of charcoal filter to remove volatiles and semi volatiles would be an acceptable/feasible solution. TF2 members to provide their views on this suggestion.*** JD explained Horiba's view on how to treat the background correction (slide #6). Their proposed method is to subtract the average background from the average emissions over the entire cycle. MM asked if there is a need to actually subtract the background and expressed a concern for possible data manipulation. TG explained that this might be necessary for systems with high background levels as emission results will appear inflated if raw emissions are reported. TG suggested that subtraction can be avoided if a maximum allowed background concentration is defined (i.e. $X \text{ \#/cm}^3$). ***It seems that such an approach can be already agreed; however, the precise value will be defined after the experimental RR campaign.***

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TG asked a clarifications from Link regarding the suitability for brake emissions measurements of the ISO recommendation on considering as **valid measurements only those when the quantity of emissions collected/measured during testing is at least five times the corresponding overall blank value.**

DL explained Horiba's choice to conduct background measurements only after the actual test. There are different views on this topic within the TF2. Link and TUI suggests having also background measurement before the test. TG asked what happens when background values before and after the test are different. RV reported minor differences according to Link's experience. ***It seems that it might worth to evaluate measurement before and after the test at the experimental RR campaign and afterwards decide on the need to apply (or not).***

No other topics were introduced by the TF2 members.

3. Next Meeting: The next meeting will take place on 12.03.2020.