BRAKE WEAR PARTICLE EMISSIONS: CURRENT STATUS WITHIN THE PMP INFORMAL WORKING GROUP

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ABSTRACT
The last two years non-exhaust traffic related emissions are being addressed within the United Nations Economic Commission for Europe at the Particle Measurement Programme Informal Working Group (PMP IWG). 4 working items (WI) have been identified as priority issues and are currently being addressed within the group. The items can be summarized to the following: Investigation of “normal” driving conditions, with the target of providing guidance for the harmonization of future studies by reaching a shared definition of typical and extreme driving conditions, compilation and monitoring of on-going related research projects, as well as networking and exchange of information with experts in the field with the target of promoting the exchange of information among all involved parties and avoiding overlapping of the activities, and finally development of a set of recommended measurement techniques and sampling procedures, which will be based upon the research needs and objectives and will serve as a guideline for future studies.

Progress has been achieved in all 4 WI. In WI-1 the initial approach involved the use of activity data collected in the framework of WLTP vehicle activity database. The most relevant parameters have been analysed and compared to real-world data provided by the industry. A short summary of the results has been presented. The intention of the group is to use this data in order to derive a brake-related driving cycle suitable for the investigation of brake particle emissions. Regarding WI-2 and WI-3, high level experts on brake wear from different organizations and origins have already joined the group and have provided feedback on the way forward. At the same time there are already several on-going projects the results of which have been presented to the group. Regarding WI-4, there is an on-going discussion regarding the procedure to be adopted for sampling brake wear particles. At the moment it seems more feasible to focus the attention on particle generation/reduction at brake system level. This will require the use of a test rig likely based on a brake dynamometer to generate, sample and characterize particles. Regardless the approach to be followed there is a general consensus that both particle mass and number should be taken into account due to the wide size range of generated particles.