

## AECC COMMENTS ON EUROPEAN COMMISSION PROPOSAL FOR REGULATION ON APPROVAL AND MARKET SURVEILLANCE OF TWO- OR THREE-WHEEL VEHICLES AND QUADRICYCLES

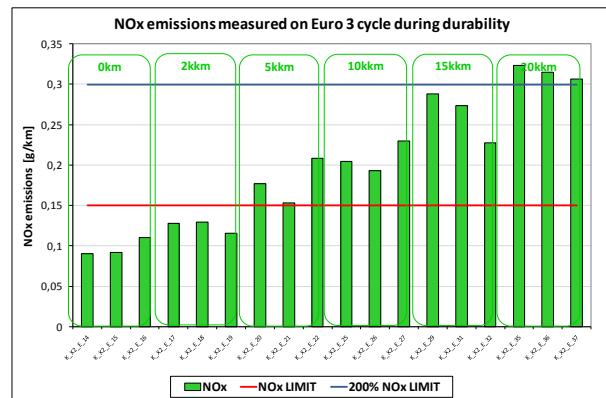
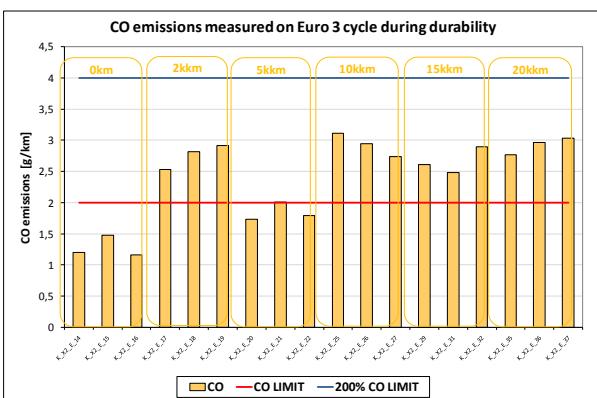
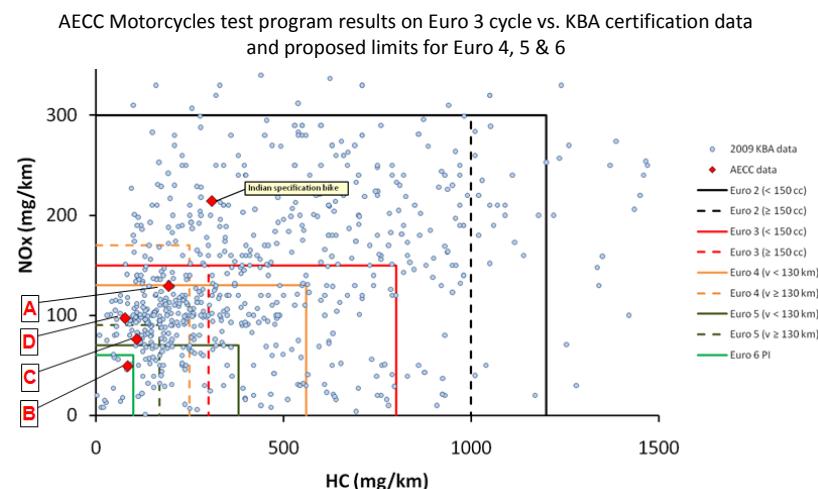
AECC\*, the Association for Emissions Control by Catalyst, welcomes the Commission proposal COM(2010)542 for a Regulation on approval and market surveillance of two- and three-wheel motor vehicles and quadricycles. AECC would like to comment this proposal on the basis of technical data obtained in an AECC Motorcycle test program, a summary of which was distributed to the MVEG Motorcycles group in October 2008<sup>1</sup>, and in a 2010 AECC Moped test program.

In the AECC Motorcycle test program, four Euro 3 motorcycles and an Indian model were tested on the Euro 3 driving cycle. Three bikes passed Euro 3 (on both ECE reg. 40 cycle and world-harmonized test cycle - WMTC) with considerable margins. Another was close to NOx limit (at 8000 km). Without any recalibration, one bike already met the proposed Euro 6 limits (equivalent to the SI passenger car Euro 5 limits) and three others already met the proposed Euro 4 limits (without durability).

When received, one bike had crossed O<sub>2</sub> sensor leads, so it was not running closed loop. OBD would have detected this.

Also, two examples of an imported (Euro 3 homologated) bike failed the Euro 3 limits initially. A specific preconditioning recommended by the importer and the use of specific reference fuel was required to obtain a pass on the Euro 3 test.

One of the four Euro 3 tested bikes, an imported 500 cm<sup>3</sup> scooter, was selected for a 30000 km durability evaluation with intermediate emissions checks. Charts below show that CO emissions reached the Euro 3 limit by 2000 km and NOx limits were exceeded after 5000 km. This poor durability does not reflect best available technology but is legally allowable because of lack of legislative durability requirements in current legislation.



In the 2010 AECC moped test program, five European mopeds were evaluated. One standard production moped, homologated to Euro 2, did not meet Euro 2 emissions limits. Current vehicles actually appear to be calibrated for fuel economy and performance, to the detriment of emissions. However, technologies are available to permit 2-stroke engines to meet proposed Euro 4 limits and proper control of air-fuel ratio is a pre-requisite for effective application of catalysts to 4-stroke mopeds.

AECC Moped test program: particulate mass and particle number

	PM	PN (to PMP)
Euro 3 cycle (8 x ECE), unweighted	mg/km	particles/km
4-stroke EFI	2.52	$3.84 \times 10^{12}$
4-stroke carburettor	5.05	$1.98 \times 10^{13}$
2-stroke LPDI	6.68	$2.35 \times 10^{13}$
2-stroke carburettor	12.39	$2.78 \times 10^{14}$
2-stroke ASDI	10.04	$1.09 \times 10^{14}$

Overall, AECC supports the final stage of emissions as proposed by the European Commission but the intermediate stages are too weak and could be strengthened. Most motorcycles and mopeds tested already meet the next emissions stages (one motorcycle already meets proposed Euro 6 without durability).

Three-wheel mopeds benefit from relaxed emissions limits at proposed Euro 3 and 4 stages but a technical justification for this is lacking.

Off-road motorcycles should remain in the scope of the regulation to ensure that trial and enduro bikes continue to comply with the same environmental standards than the rest of the L-category vehicles.

AECC also supports the introduction of durability requirements, without which it is possible that some motorcycles might not be equipped with durable catalytic converters, and OBD requirements.

Finally, emissions limit values of hybrid vehicles should be defined according to the technology of their internal combustion engine and not all aligned to CI engines as currently proposed.

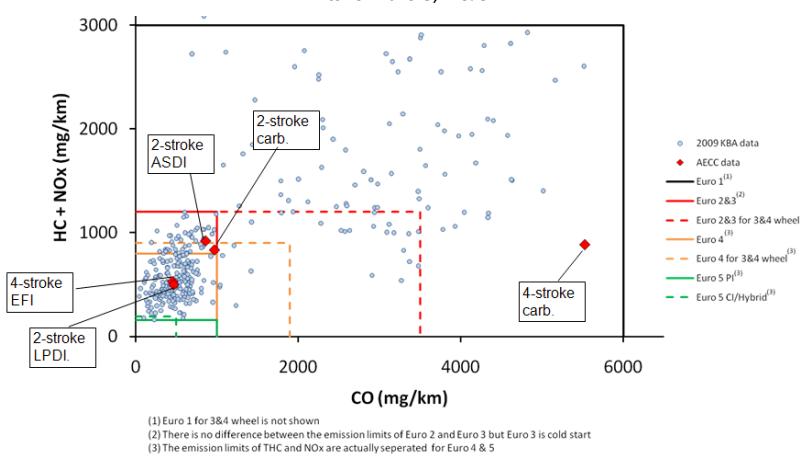
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<sup>1</sup> Brief Summary of the 2008 AECC Motorcycle test program, MVEG Motorcycle meeting, 20 October 2008, [www.aecc.eu/content/pdf/081020%20AECC%20summary%20Motorcycle%20test%20program.pdf](http://www.aecc.eu/content/pdf/081020%20AECC%20summary%20Motorcycle%20test%20program.pdf).

\*AECC is an international non-profit scientific association of European companies engaged in the development, production and testing of catalyst and filter based technologies for vehicle and engine emissions control. This includes the research, development, testing and manufacture of autocatalysts, ceramic and metallic substrates and speciality materials incorporated into the catalytic converter and filter and catalyst based technologies to control engine emissions. Members' technology is incorporated in the exhaust emission control systems on all new cars and an increasing number of commercial vehicles, buses and motorcycles in Europe. More information on AECC can be found at [www.aecc.eu](http://www.aecc.eu). Information on emissions control retrofit for existing heavy-duty vehicles and non-road machinery can also be found at [www.dieselretrofit.eu](http://www.dieselretrofit.eu).

AECC's members are: BASF Catalysts Germany GmbH, Germany; Corning GmbH, Germany; Emitec Gesellschaft für Emissionstechnologie mbH, Germany; Ibaden Deutschland GmbH, Germany; Johnson Matthey PLC, United Kingdom; NGK Europe GmbH, Germany; Rhodia Electronics & Catalysis, France and Umicore AG & Co. KG, Germany.

AECC Moped test program results vs. KBA certification data and proposed limits for Euro 3, 4 & 5



Regarding particulates from mopeds, only the 4-stroke EFI model would meet the PM limit of 4.5 mg/km proposed for the Euro 5 stage. Similar levels of particle numbers to those of diesel cars without DPF have been measured on all mopeds tested. The compositional analysis of particulates shows very little elemental carbon (mostly organic), despite the high solid particle number results.