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## **Poster-Abstract Form**

Name of Author: Jan Czerwinski  
Co-Authors: Pierre Comte  
Affiliation: Laboratory of IC-Engines and Exhaust Gas Control (AFHB)  
Mailing address .....  
Phone / Fax..... E-mail.....

**Title: Catalyst Ageing and Particle Emissions of 2-S Scooters**

**Abstract: (min. 300 - max 500 words)**

During the Swiss Scooter Network Project 2004-2007 some ageing procedures of catalysts were performed.

Catalyst, which is polluted by oil overtreatment and low-temperature driving, has longer light-off times and lower conversion rates. It can be cleaned by means of full load driving, but it does not come back to the original parameters in new state.

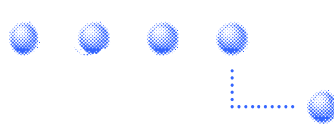
With a thermally aged catalyst and with dummy (catalytic support without wash coat and without coating) it was demonstrated, that the missing catalytic activity causes higher CO, - HC -, values, but also increased condensates and particle mass. The emitted nanoparticles are in a bigger size spectrum.

**Short CV:**

**BIOGRAPHICAL SKETCH Dr. J. Czerwinski:**

- Study of Mechanical Engineering in Austria
- Assistant on the Technical University, Vienna Ph.D. about combustion in SI-engines
- R & D diesel injection systems, diesel combustion, Voest Alpine Friedmann, Austria
- R & D turbocharging systems, Asea Brown Boveri, Switzerland
- Since 1989, professor for thermodynamics and IC-engines, head of the Laboratory for Exhaust Gas Control, University of Applied Sciences, Biel-Bienne, Switzerland

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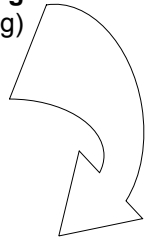
# Catalyst Ageing and Effects on Particle Emissions of 2-S Scooters

J.Czerwinski, P.Comte AFHB, University of Applied Sciences, Biel-Bienne, CH

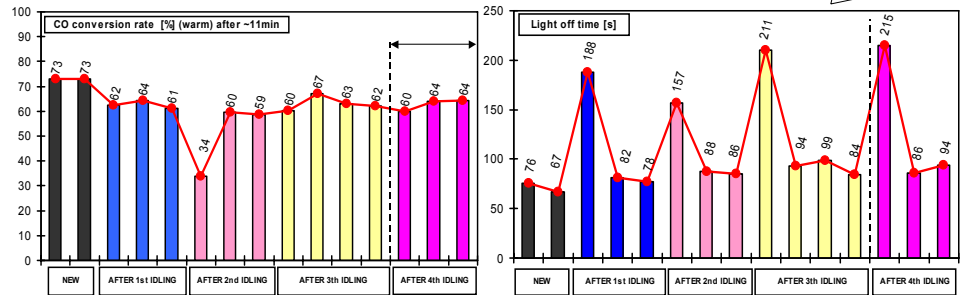
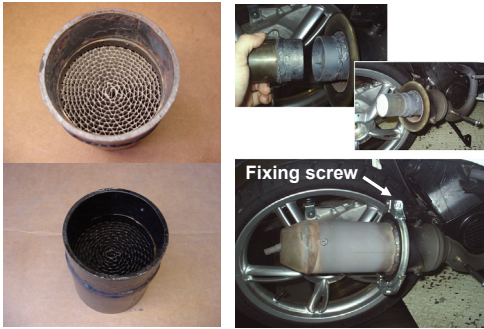


## Catalyst ageing

- thermal oven-ageing (by manufacturer)
- physico-chemical ageing (on vehicle, oil overdosing)
- pollution & cleaning (disassembled muffler)



## Phase 1 : Pollution of the catalyst in long run tests & idling



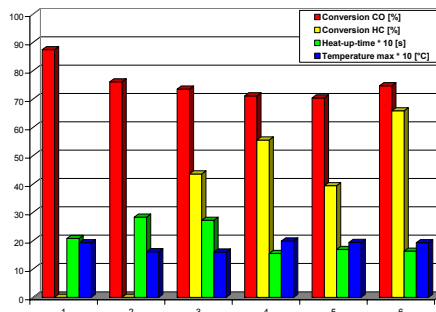
- CO conversion rate (warm) and light off time after cold starts pollution of catalyst by oil overtreatment (4%) and 4h idling

Peugeot Looxor carb.; lube oil: Panolin TS

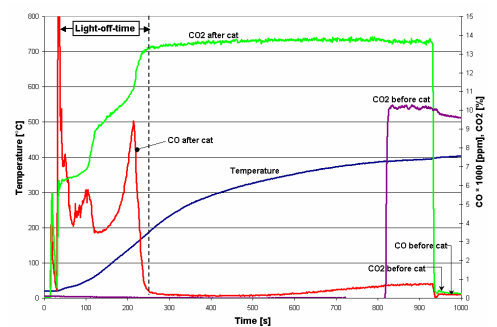
## Phase 2 : ageing procedure

- Oil overdosing (summary approx. 4%)
- 2h idling - 10 min FL\* - 2h idling  
- 10 min FL - 2h idling - 10 min FL  
- 2h idling  
\* FL ...full load
- Cooling down with blower (minimum 30 min)
- Cold start with acceleration to FL (10 min gas measurement after cat)
- Gas measurement before cat nondiluted
- Gas measurement before cat diluted
- Gas measurement after cat diluted

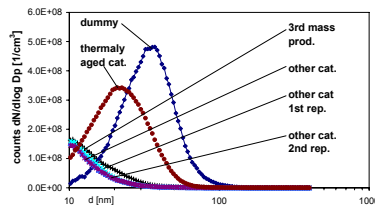
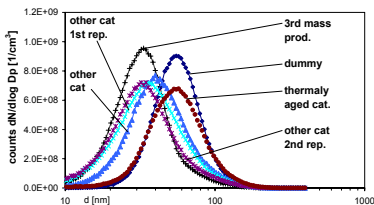
Stationary warm



► Results of ageing with Gilera DI

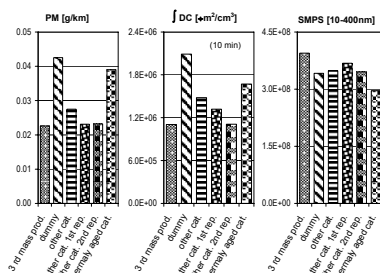


► Definition of light-off-time of Typhoon Carb.

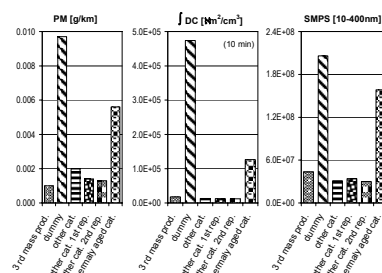


## Phase 3 : Catalyst screening at 40 km/h

- lower PM-oxidation with dummy, or with aged catalyst



Gilera DI



Typhoon Carb.

