

Vision of stage 3 Vehicle Interior Air Quality improvement

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Stage 3 main objectives

1. Further Vehicle Interior Air Quality improvement by taking into account intake air filtering
2. Developing of harmonized methodology for assessing of interior air filtering efficiency in a complete vehicle.

Test substances:

- ✓ carbon monoxide (CO)
- ✓ nitrogen monoxide (NO)
- ✓ nitrogen dioxide (NO₂)
- ✓ formaldehyde (CH₂O)
- ✓ particulate matter (PM_{2.5} and PM₁₀, fine particles)
- ✓ ozone (O₃)

Proposed tests

All test are carrying out in polluted atmosphere.

Test type 1: air cleaning efficiency from particles

Test type 2: air cleaning efficiency from gaseous components

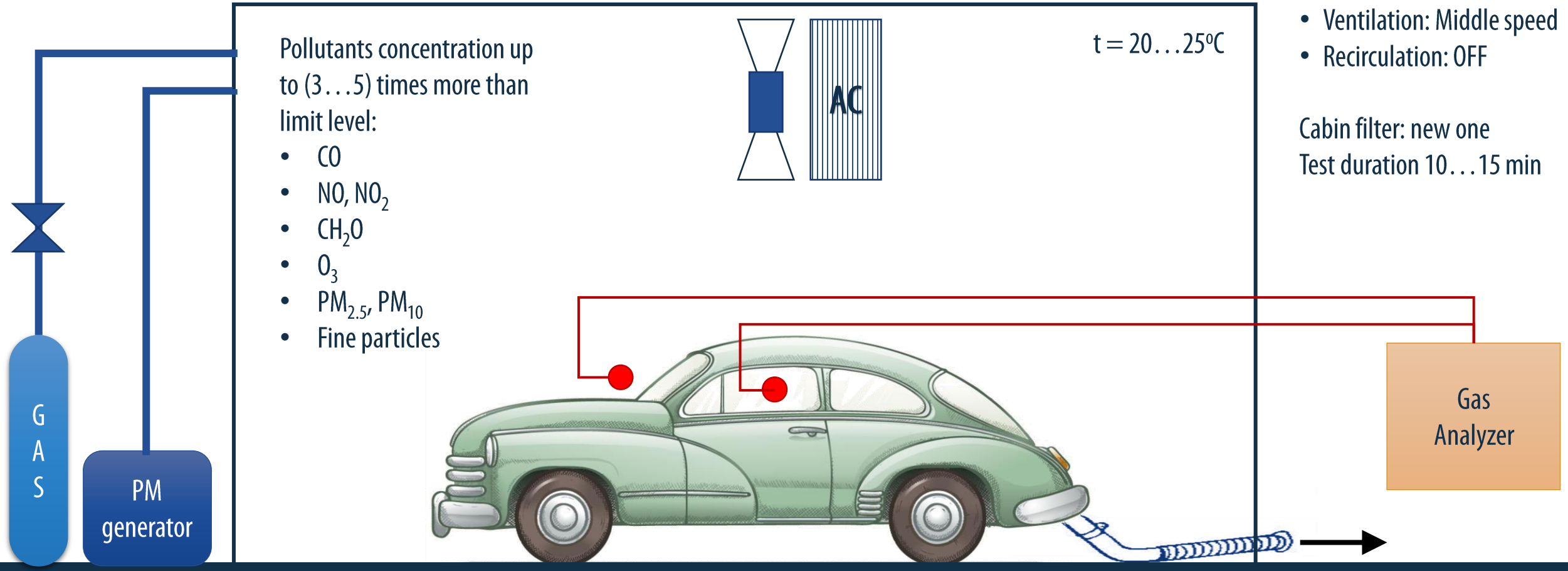
Proposed tests methods

I method: Chamber test

II method: Real world test

Test methods: method I – Chamber test

Chamber test reproduces worst conditions of car using in polluted air (traffic jams, tunnel, etc.)

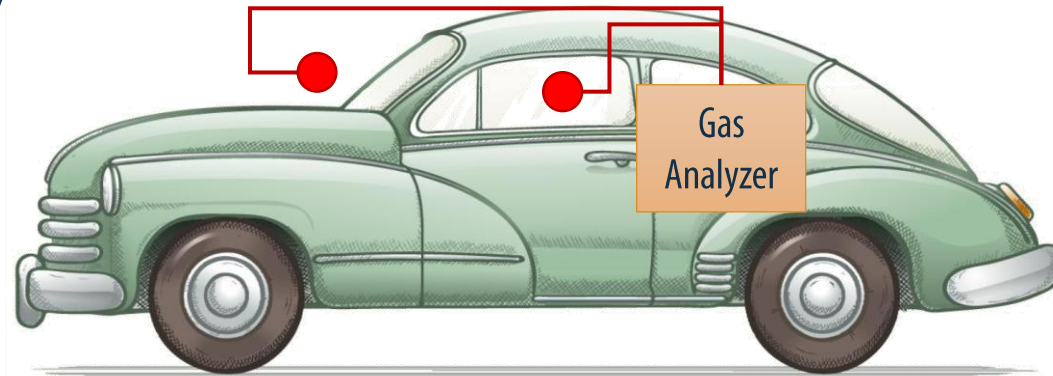


Test methods: method II – Real world test

The test reproduces conditions of car using at real world driving

Pollutants concentration must be near limit level:

- CO
- NO, NO₂
- CH₂O
- O₃
- PM_{2.5}, PM₁₀
- Fine particles



Test settings:

- Ventilation: Middle speed
- Recirculation: OFF
- Interior air temperature 18...22°C

Cabin filter: new one

Test duration 30...60 min

Air quality cleaning compliance criteria

Integral air cleaning efficiency:

$$\eta = \left[1 - \frac{\int_0^{\tau} C_{in} dt}{\int_0^{\tau} C_{out} dt} \right] \cdot 100\%$$

C_{in} , C_{out} – concentration of pollutant inside and outside tested car, respectively

t – time

τ – test duration

Air cleaning efficiency classes (for example)

Cleaning efficiency class	Particles	Gaseous components
1	30	0
2	50	30
3	80	60

Thank you for your attention!

