VIAQ-21-06

AIR Allow Independent Road-testing

EMISSIONS ANALYTICS

Progress update on developing standardised method for measuring particle ingress into the cabin and CO_2 build-up

Nick Molden, Co-Founder AIR

VIAQ Informal Working Group

11 January 2021

Overview

- Method originally proposed by the AIR Alliance, based on SAE paper
- Drafting CEN Workshop Agreement document
- Additional background information exchanged
- Further testing to validate proposed method

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Development of a Standard Testing Method for Vehicle Cabin Air Quality Index

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Abstract

Vehicle cabin air quality depends on various parameters such as number of passengers, fan speed,

History
Received: 14 Dec 2018
Revised: 14 Mar 2019

Technical sub-committee – Work packages

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- WP1 – Perform additional testing for PN ingress, CO_2 build up (and NO_2)
- WP2 – Assess robustness of method for calculating cabin air quality index
- WP3 – Review proposed boundary conditions
- WP4 – Review and expand proposed equipment specifications

➢ Group chaired by Nick Molden, with input so far from Heejung Jung, David Booker

WP1 – Additional testing

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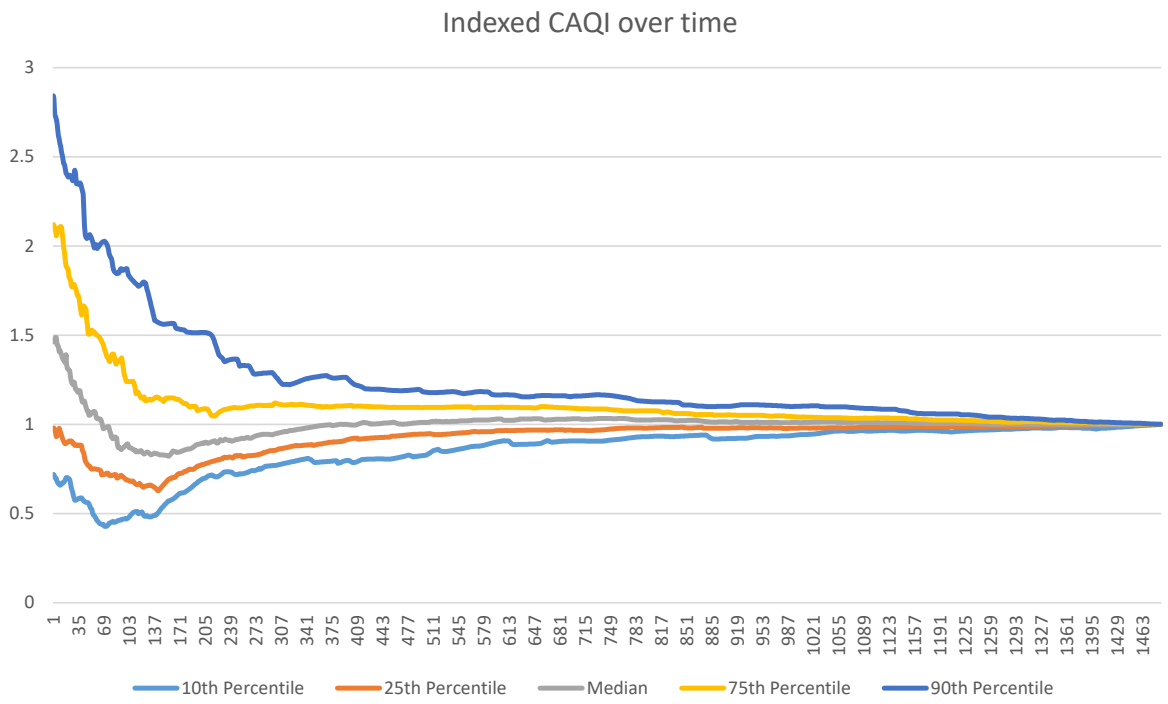
- 97 tests on different vehicles, replicating SAE method, with PN counter
- 12 tests on the same vehicle, also SAE method and PN counter
- Assessment tests on AE51 microAeth and AM520, NAQTS PM sensor

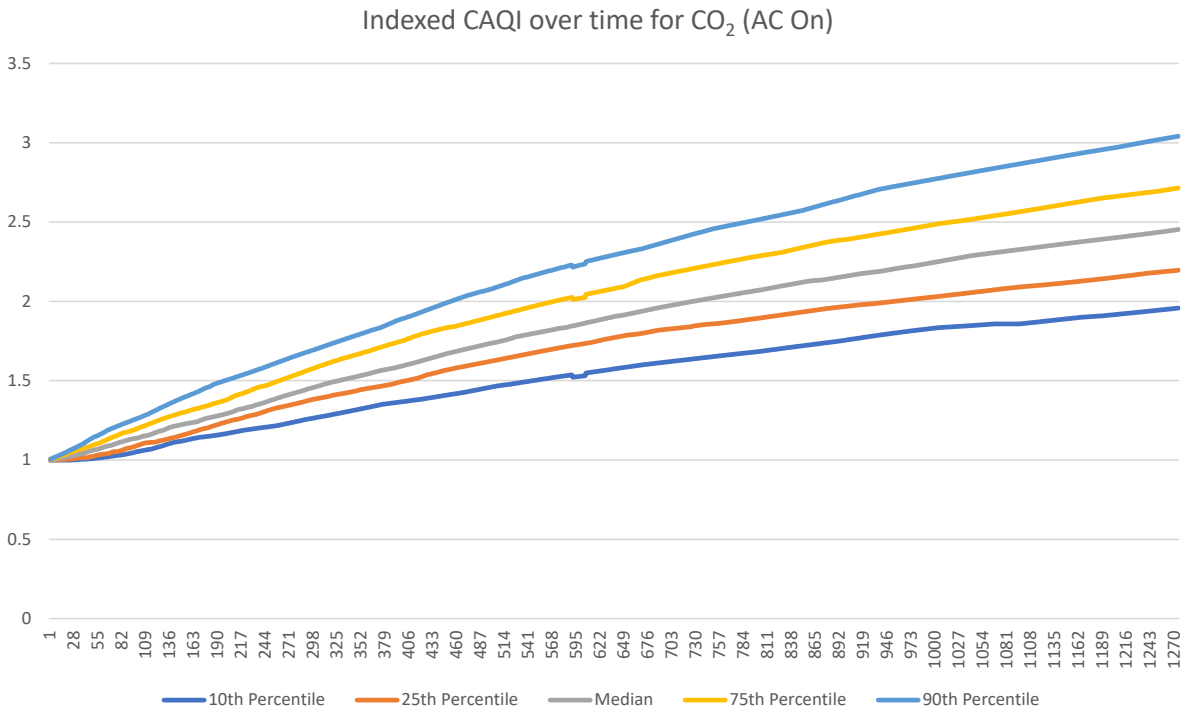
WP1 – Convergence of PN CAQI – fresh air mode

- Normalised
- Convergence within 25 minutes
- Irrespective of start ratio of internal/external PN concentrations
- CAQI >1 observed



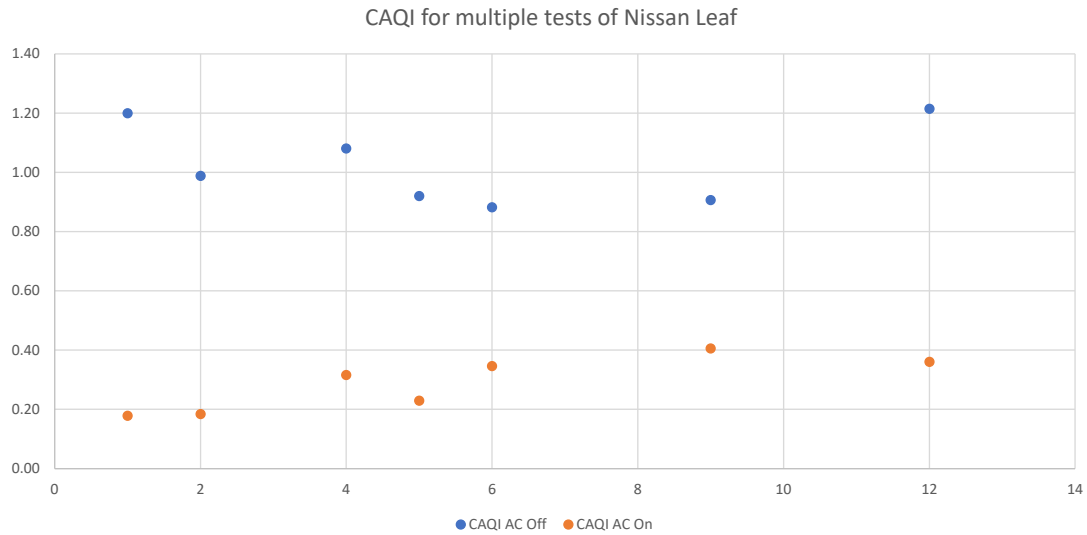
WP1 – CO_2 trends on recirculation mode

- Similar, near-linear growth of CO2 on recirculation mode



WP2 – Repeatability

- 12 tests on same route with Nissan Leaf; 7 good results
- CAQI range 0.88 to 1.21
- No extra boundary conditions



WP3 – Boundary conditions

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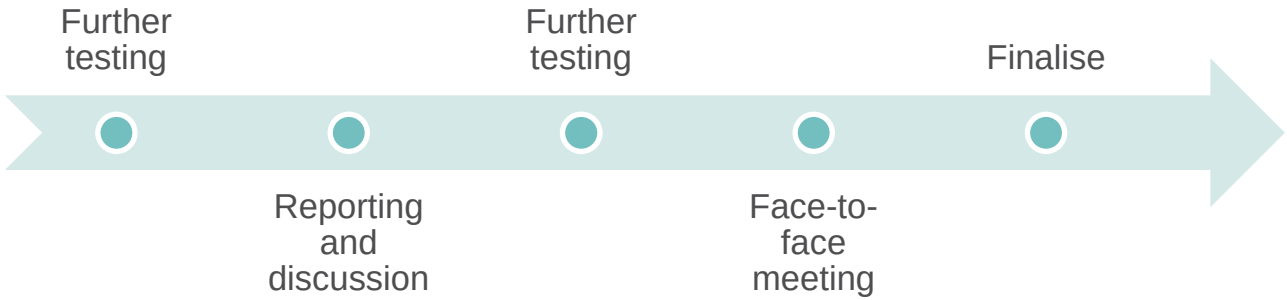
- Not yet been tested
- Boundary conditions to consider (not exhaustive)
  - Exterior concentration levels
  - Vehicle dynamics
  - Route – tunnels, etc
  - Ambient conditions

Next steps

- Further test programme in Q4 2020/Q1 2021
- Reporting of results around March 2021 – probably virtual
- Discussion and refinement of draft CWA
- Face-to-face meeting in Q2



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