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Procedure for artificial aging of cabin air filters

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Scope and application

- This procedure applies to a category 1-1 vehicle, as defined in the Special Resolution No. 1.
- This procedure is part of the informal document VIAQ 27-04 under section 7.5. The filter aging procedure.

Definitions

- The test vehicle should be equipped with OEM-approved cabin air filter artificially aged to 3.000 km.
- To define a cabin air filter with min. 3.000 km lifetime it is taken into account, that major automotive OEMs define a total lifetime for a cabin air filter between 30.000 km and 60.000 km and connect this mileage with a filter pressure loss increase of approx. +100 Pascal. A lifetime of 3.000 km to 6.000 km corresponds then to a pressure loss increase of approx. +10 Pascal on average (may slightly vary between different filter types).
- The test air volume flow should be according to the nominal air flow specified by the OEM, if this nominal air flow is unknown use 300 m^3/h air flow.

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- **Definitions (cont.)**
- Test dust is ASHRAE dust as shown in ANSI/ASHRAE Standard 52.2-2017 section 6.2 Loading Dust. This ASHRAE test dust contains 23% soot particles from powdered carbon black, which will stick to the filter, so the aged filter is easy to handle during installation in the HVAC system.
- Artificial aging shall be done by dust loading with ASHRAE test dust until the pressure loss increased by +10 Pascals at nominal air volume flow rate.
- Standard test rig according to ISO/TS 11155-1 or similar.
- Proposed dust dosing system: solid aerosol generator with a dosing belt and a dust injector.
- Dust loading with an ASHRAE dust concentration of 75 mg/m^3
- Air temperature 15 - 30°C
- Relative air humidity < 70% rH

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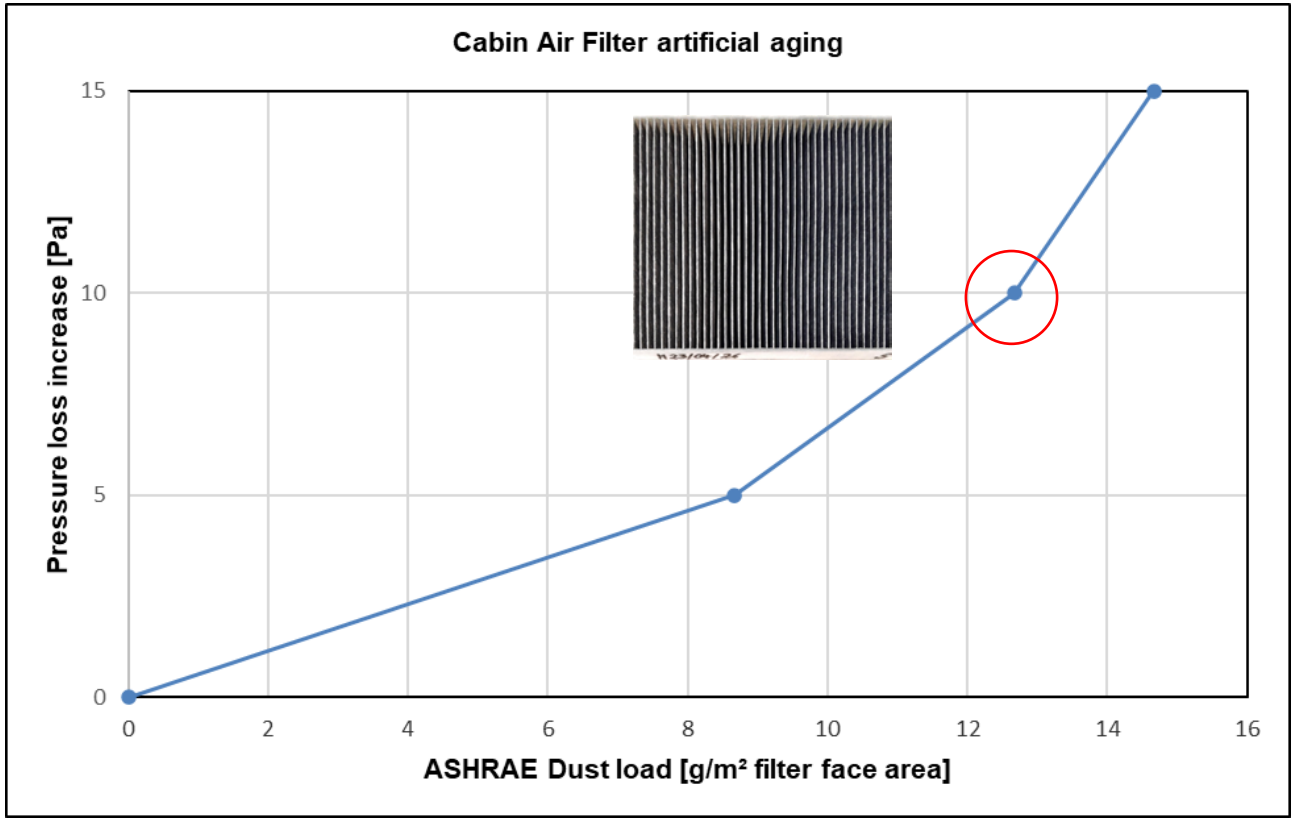

- Approx. 12,7 g ASHRAE dust load per m^2 filter face area to reach a 10 Pascal pressure loss increase
- Filter face area: 0,075 m^2
- Total dust feed: 1g

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Conclusion

- Test procedure is applicable for all different types and sizes of cabin air filters
- Test procedure is fast and the aged filters are easy to handle afterwards in the test procedure as shown in VIAQ-27-04.
- Standard ISO test rigs can be used

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Bibliography

- ISO/TS 11155-1:2001-11 *Road vehicles — Air filters for passenger compartments — Part 1: Test for particulate filtration*
- ANSI/ASHRAE Standard 52.2-2017 *Method of Testing General Ventilation Air-Cleaning Devices for removal Efficiency by Particle Size*