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Procedure for artificial aging of cabin air filters 2

VIAQ-30-05

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FREUDENBERG FILTRATION TECHNOLOGIES

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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.

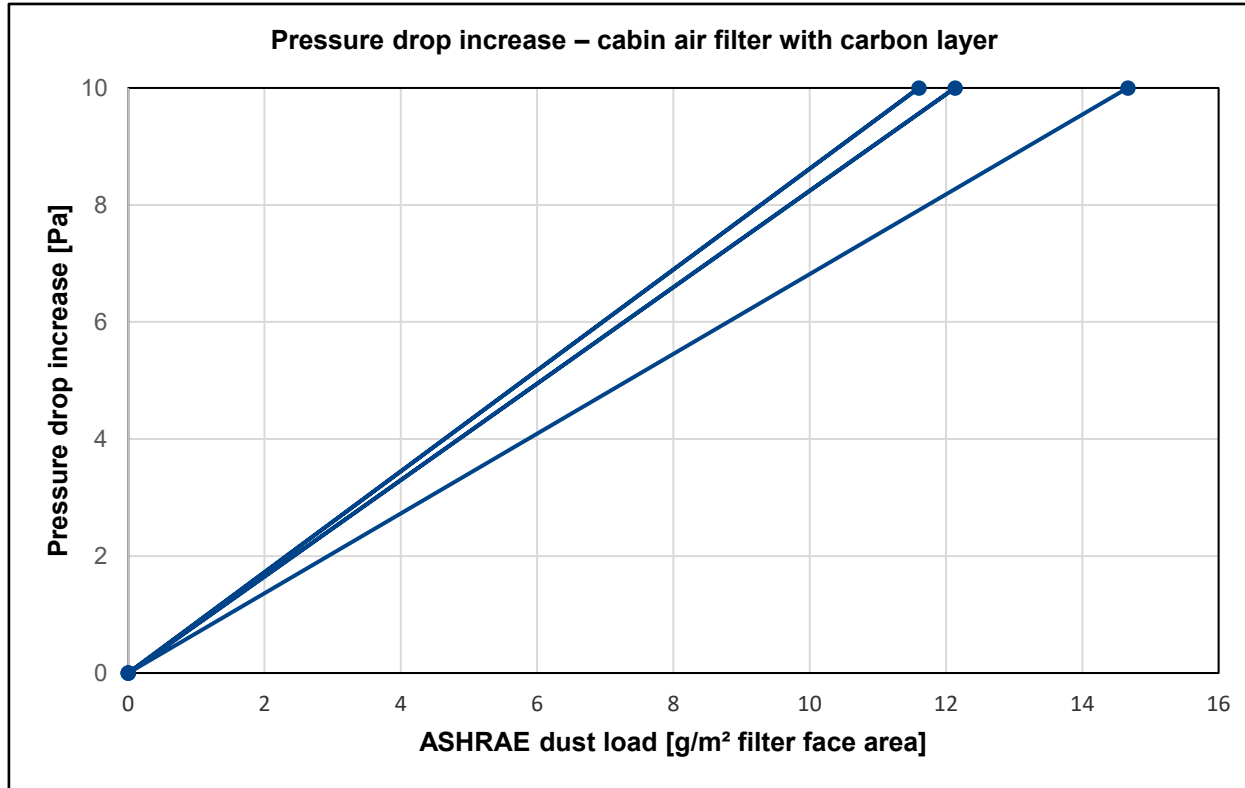
Definitions

- 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). Test procedure duration approx. 30 min.
- 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 m³/h air flow.

- **Definitions (cont.)**
- Test dust is ASHRAE 52.2 dust. ASHRAE 52.2 test dust contains soot particles 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 52.2 test dust until the pressure loss increased by +10 pascals at nominal air volume flow rate.
- Standard filter test bench according to ISO/TS 11155-1 or similar.
- Proposed dust dosage system: belt-dust feeder with injection.
- Dust loading with ASHRAE test dust and a concentration of 75 mg/m³
- Air temperature 10 - 30°C
- Relative air humidity < 70% rH

Test results for cabin air filters with carbon layer

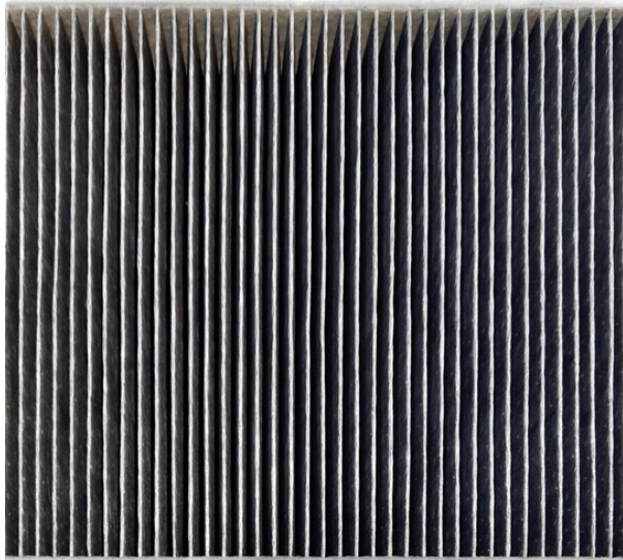
Procedure for artificial aging of cabin air filters – cabin air filter with carbon layer



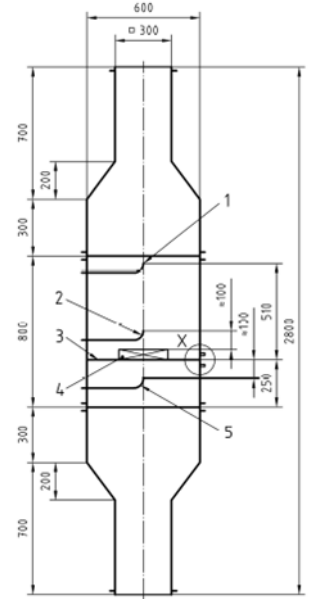
- From 10,8 g to 14,4 g ASHRAE dust load per m² filter face area to reach a 10 Pascal pressure loss increase
- Filter face area: 0,075 m²
- Total dust feed: ~1g

Procedure for artificial aging of cabin air filters

Cabin air filter after ageing procedure with uniform dust distribution

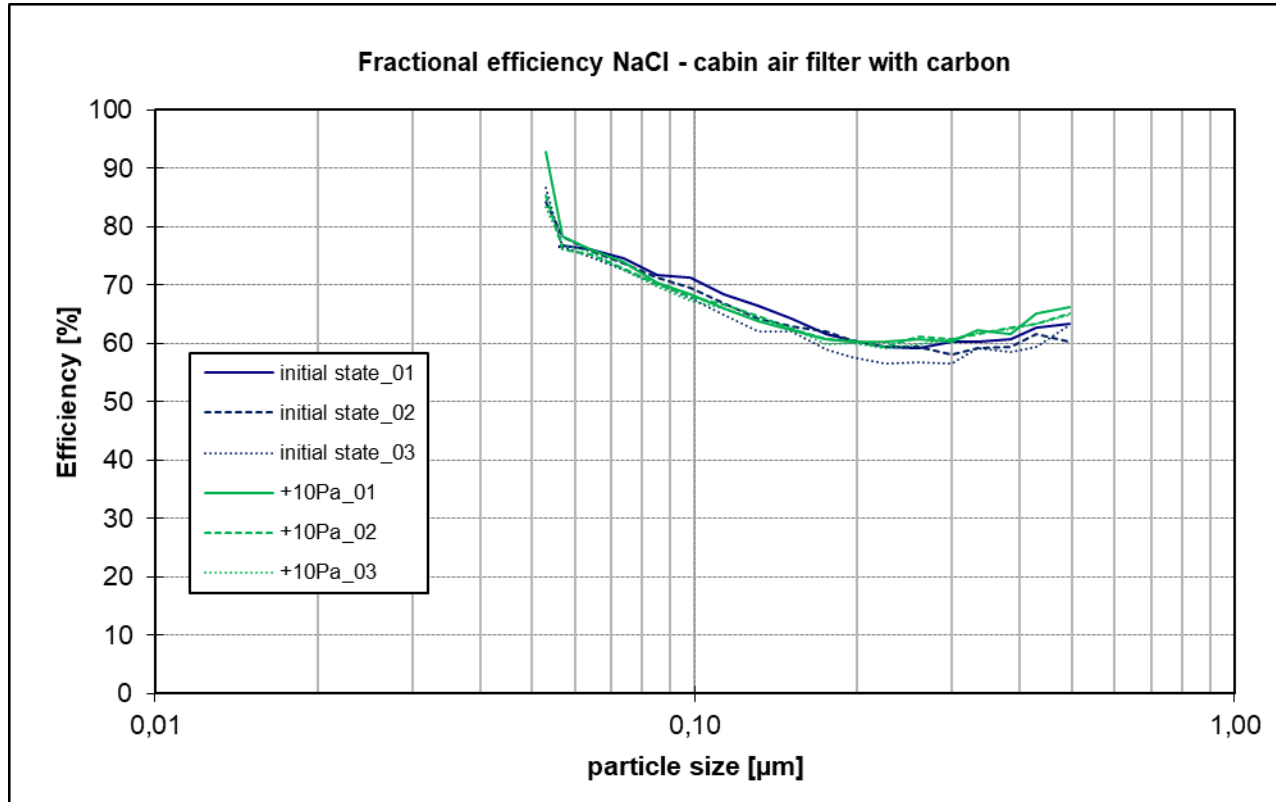


ISO/TS 11155-1 test bench



Influence of the ageing procedure on the efficiency of the cabin air filter

Procedure for artificial aging of cabin air filters – cabin air filter with carbon layer



- Fractional efficiency of cabin air filters with carbon layer measured new (initial state) and after the ageing procedure (+10Pa) show similar efficiency results

- **Conclusion**
- Test procedure is applicable for all different types of cabin air filters used
- Test procedure is fast and aged filters are easy to handle afterwards => no dust loss or damage can occur during handling and installation
- Standard filter test bench can be used
- For more information see also VIAQ 17-12 & VIAQ 27-06