



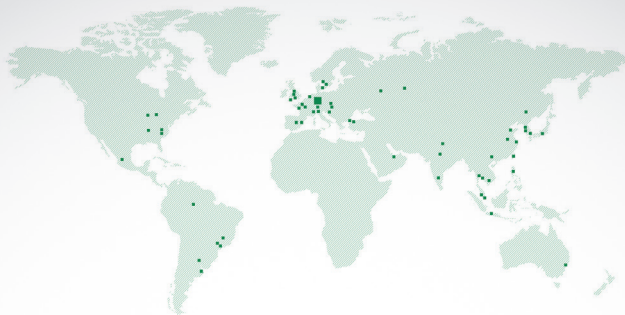
MANN+HUMMEL Contact

Martin Klein

Vice President Cabin Air Filtration
martin.klein@mann-hummel.com
Phone: +49 9273 9656 379

MANN+HUMMEL Innenraumfilter GmbH & Co. KG
Kulmbacher Straße 12
95502 Himmelkron
Germany

www.mann-hummel.com



MANN+HUMMEL Group

MANN+HUMMEL is a leading global expert for filtration solutions. The company group with its headquarters in Ludwigsburg, Germany, develops solutions for motor cars, industrial applications, clean air in interior spaces and the sustainable use of water. In 2016 the group achieved sales of approx. 3.5 billion euros worldwide with more than 20,000 employees at more than 80 locations. The products manufactured by the group include air cleaner systems, intake manifold systems, liquid filter systems, plastic components, filter media, cabin filters, industrial filters and membrane filters.

FreciousSmart Cabin Air Filter System

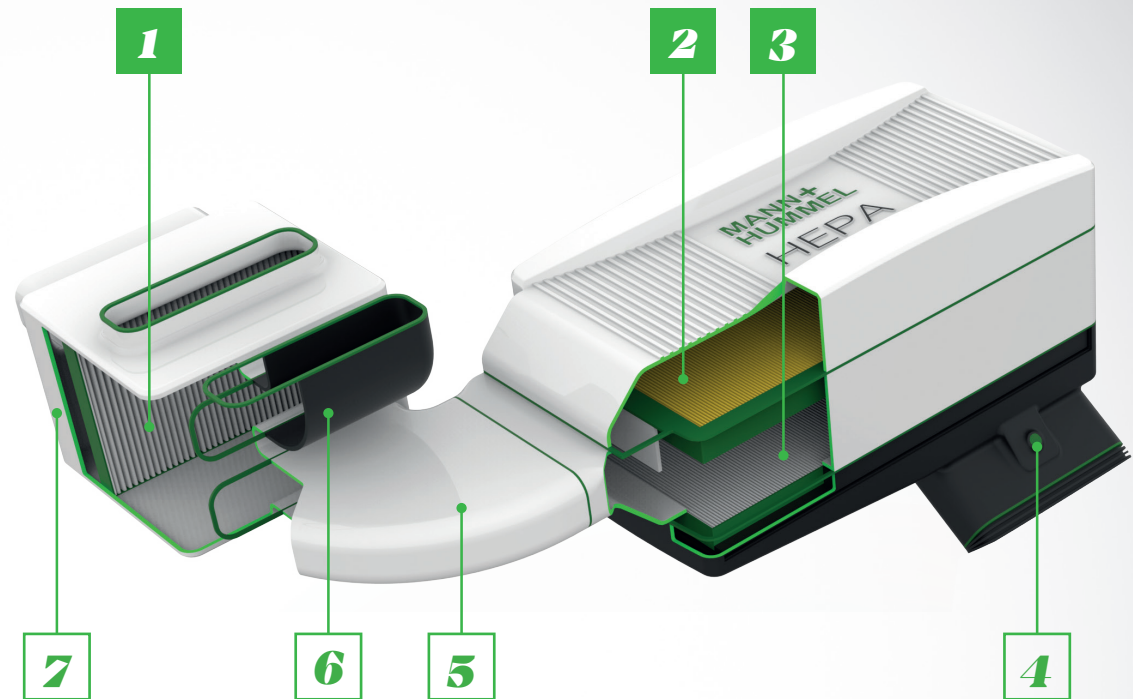
- ✓ Saves energy
- ✓ Ensures best air quality
- ✓ Maximizes filter lifetime

FreciousSmart Cabin Air Filter System

In order to protect vehicle occupants from increasing air pollution, MANN+HUMMEL has come up with FreciousSmart – an intelligent cabin filter system with three filtration stages. It continuously ensures the air inside the vehicle is always clean regardless of the different driving conditions such as in a tunnel or traffic jam.

The new development is focused on electric vehicles facing the challenge to increase the driving range. The heating up and cooling down of ambient air drains the battery and therefore reduces the amount of energy available to power the vehicle. FreciousSmart enables the air conditioning system to be operated mainly in recirculation mode, which saves energy.

The indoor air quality sensor measures the CO₂ content, the air humidity and temperature and determines how much outdoor air is actually required. At the same time the outdoor air quality sensor recognizes the degree of contamination of the ambient air and only switches on the respectively required filter. This offers constantly maximum protection for the vehicle occupants while maximizing the driving range and enabling the longest service interval for the filter.



1. Interior Air Filter

- Biofunctional filter layer with anti-allergenic and antimicrobial properties
- Retains pollen and fine dust particles (PM_{2.5})
- Adsorbs harmful gases

2. HEPA Filter

- Over 99.95% filtration efficiency of PM₁ and ultra fine particles (< 0.1 µm)

3. Ambient Air Filter

- High efficient filtration of fine dust particles (PM_{2.5})
- Removes harmful gases such as nitrogen dioxide (NO₂), ammonia (NH₃) and volatile organic compounds (VOC) such as formaldehyde

4. Outside Air Quality Sensor

5. Clean Side Duct

6. Outside Air Supply

7. Recirculation Unit

- Three filtration stages for best possible protection of the vehicle occupants
- Outdoor air quality sensor and indoor air quality sensor continuously monitor the air quality
- Three flaps regulate as required by situation which filters are used

**FreciousSmart – maximum protection at
lowest energy consumption**