

Criteria for allergy-friendly vacuum cleaners

BACKGROUND

It's impossible to keep allergens outside at all times. Pollen, mould spores and bacteria can make their way indoors despite preventive measures such as only airing out rooms early in the morning.

Special vacuum cleaners can remove some allergens from floors, surfaces and the indoor air, resulting in significantly reduced symptoms in people with hay fever or allergic asthma. The European Centre for Allergy Research Foundation (ECARF) certifies allergy-friendly vacuum cleaners that achieve a measurable reduction in the indoor allergen load and securely trap the vacuumed allergens.

The Seal is granted if compliance with the following criteria is demonstrated. The criteria are based on the principle that a lower allergen exposure generally results in better outcomes.

1. CRITERIA

1.1. Necessary Product Features

The manufacturer shall provide proof (by means of test results from recognised external and independent testing institutes) on the basis of documents relating to the following parameters:

- **Dust emissions from the vacuum cleaner in accordance with DIN EN 60312** using mineral dust type 4 (A2 quartz dust according to ISO 12103-1) and, to a greater extent, fraction separation efficiency using a KCl aerosol generated from a liquid phase, as well as a test of particle detachment during pressure surges. In addition, the maximum volume flow of the device is determined and a temperature difference measurement of the air inlet/outlet is carried out after 20 minutes of operation.

Note: Testing with quartz dust (higher average particle sizes) results in higher efficiencies due to the electrostatic charge of the particles during atomisation, which would be difficult and difficult to reproduce even with 'neutralisation' measures. An aerosol generated from a liquid solution (KCl, very small average particle sizes) has a low electrostatic charge and leads to lower and therefore more critical results.

- **Filtration efficiency with potassium chloride (KCl)**

The measurement is performed in new condition and after 10 minutes of loading with mineral dust type 4 using an optical counter in the particle size range 0.3-5 µm at maximum volume flow of the device to be tested at room temperature and < 65% relative humidity. The aerosol application and upstream measurement are adapted to the suction area of the vacuum cleaner, while the downstream measurement is adapted to the complete outlet of the device.

Criteria:

Particle size (geometric diameter) [μm]	KCI Efficiency [%]	KCI Efficiency [%] after 10 minutes loading
0.3-0.5 μm	> 98.5 %	> 99 %
0.5-1.0 μm	> 99 %	> 99.5 %
at 3 μm	> 99.9 %	> 99.9 %

Filtration efficiency with quartz dust (mineral dust type 4 or 'A2')

The measurement is averaged over 10 minutes of loading with 100 mg/m³ mineral dust type 4 (as total volume or mass signal) using a photometer or the mass signal of an optical counter in the particle size range 0.3-10 μm at maximum volume flow of the device under test. After the measurement with KCI (see above), a second loading is carried out over 10 minutes.

Criteria: Average filtration efficiency for both loadings: > 99.99 % (< 0.01 % penetration)

Particle release during pressure surges

This test measures possible particle release during or after a pressure change. After the second loading, the air inlet of the vacuum cleaner hose is closed for 5 seconds over a period of 10 minutes while the vacuum cleaner's fan runs at maximum power to create negative pressure. The sudden opening of the inlet causes a rapid increase in air flow, which can release particles from the filter element.

The photometer (or mass signal OPC, see above) is used to measure the concentration that may have been released in the air outlet.

Criteria: Dust release < 0.03 mg/m³

User manual provides instructions for operation and filter change.

Warning that the inside of the appliance may become contaminated if the instructions in the user manual are not followed.

- Optional: Wipe function:** An additional wipe function is helpful for hard floors because no dust is stirred up during the simultaneous vacuuming and wiping, but is bound by moisture.
- For bagless vacuum cleaners,** the following applies according to the operating instructions: Enclose the opening of the container with a dust-tight plastic bag when emptying. Carefully remove the dust container, close the plastic bag tightly and then dispose of it, ideally outdoors, so as not to inhale any dust.
- All product characteristics must be documented by the manufacturer and verified by ECARF.

2. QUALITY CONTROL AND COMPLAINT MANAGEMENT

The manufacturer has established a functional system of quality control that responds effectively to consumer complaints. The system ensures the following:

- The manufacturer's contact details, such as the address, telephone number and/or email address, are clearly visible on the product packaging;
- Consumer complaints are handled and followed up in an appropriate manner by qualified and experienced personnel of the manufacturer;
- The assessment of consumer complaints and, if applicable, any inferred areas of improvement are reapplied to product quality and safety. The manufacturer agrees to make this data available to ECARF on an ongoing basis.