

adhesion

ADHESIVES + SEALANTS

The Trade Journal for Industrial Adhesives and Sealants

Wetting Test

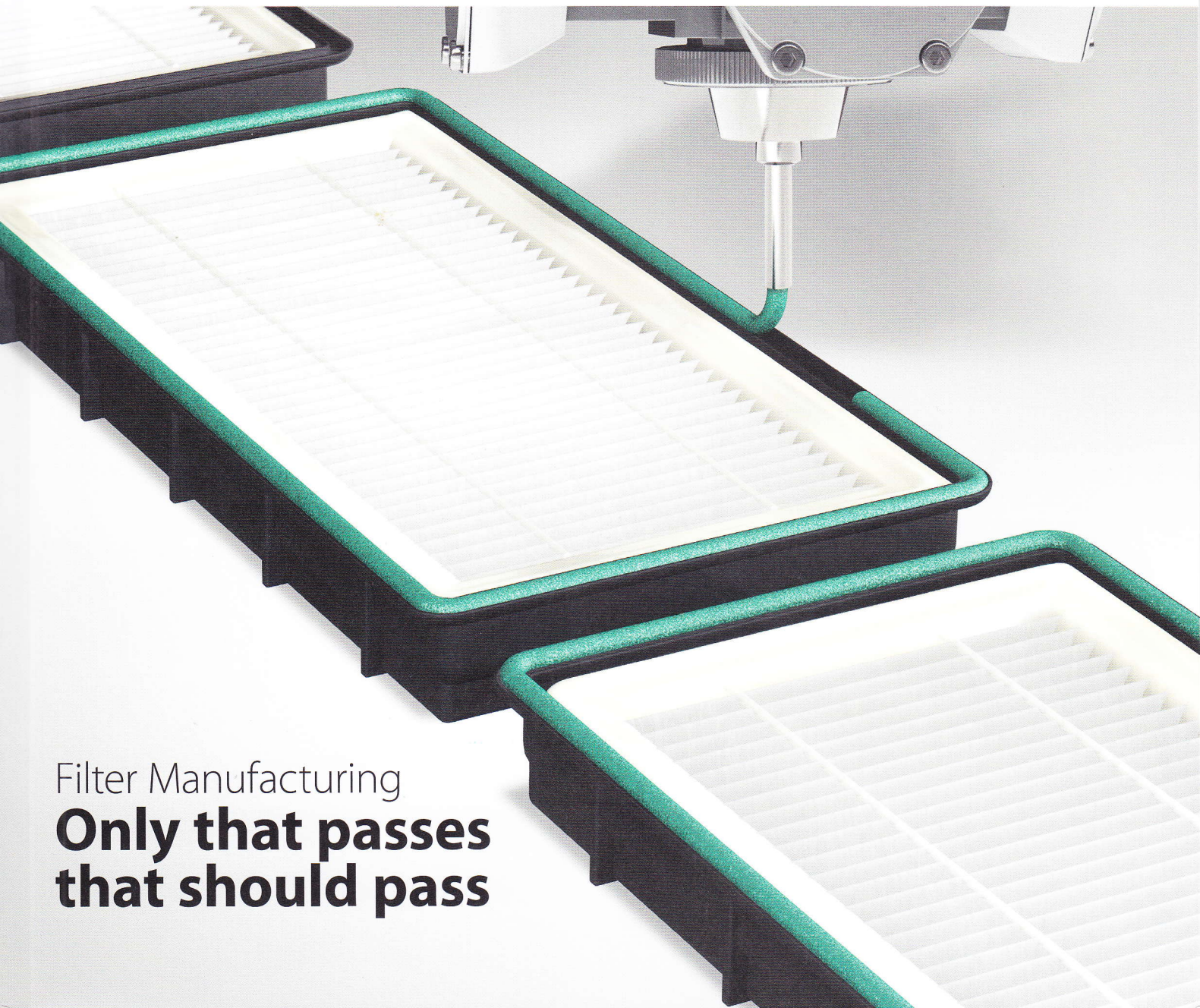
100 % inspection of surfaces before gluing

Market Overview

Raw materials for the formulation of adhesives and sealants

OCT Inspection

Continuous control of sealing seams



Filter Manufacturing

**Only that passes
that should pass**

Only that passes that should pass

Whether used in vacuum cleaners, cars or air conditioning of industrial plants – the quality of filters plays an important role in many productions and products. So that filters keep their promises, they must be well glued and ensure a perfect seal.

Florian Kampf

Filters are available in numerous versions and basically assume the task of separating solid substances from liquid or gaseous. In principle, they are all the same in their structure: from one side contaminated air flows in and filtered out on the other. In what quality this happens is a question of the claim. In order for the filters to hold what they promise, depending on the specific application, they must be well glued and perfectly sealed. To ensure this, the mixing and dosing system used and the selected material system should be fine-tuned to each other.

In order to cover all possible applications from vacuum cleaner to air filter for clean room quality, manufacturers of filter systems have a wide range of 2-component foam gaskets, adhesives and potting compounds available. With the FIP (F) G dosing technology (Formed In-Place (Foam) Gasket) established in the filter industry, the material systems are automatically applied directly to the filter frames. The 2-component reaction materials cure at room temperature on the components and can be processed further.

Potting with self-healing effect

That the requirements for the potting material used can be very high depending on the application area, can be shown in fil-

ters for air-conditioning systems (HVAC) in hospitals and for chip production in clean rooms. The filter frame is placed on a frame counterpart with a peripheral edge when installed in the HVAC system. The frame edge plunges into the casting gel according to the spring-groove principle. The filter seat is sealed airtight so that all air passes through the filter and air contaminants do not pass into the conditioned air. It is crucial for repeated air tightness that, when the filter frame is removed, the immersion point of the frame edge in the casting gel is always reformed due to the self-healing effect of the potting.

Precise sealing, gluing and potting

Not only the proper selection of raw materials is decisive for a consistently high quality in sealing, gluing and potting of filters, but also the safety and accuracy of the production plant, which has to ensure a precise application process of the material to the parts. For this, low-pressure mixing and dosing systems are available on the market.

An example is the Smart-M (Sonderhoff) dispensing cell. Its modular design is flexibly adaptable to different production concepts. Subsequent modifications can easily be realized with low planning effort.

Due to the small outside dimensions of 1200 x 1700 x 2400 mm (width x depth x height) the cell has a minimal foot print. The 3-axis linear robot scans parts with a traversing range of up to 500 x 600 mm (width x depth) and up to a part height of 250 mm at the most. In doing so, the mixing head of the dispensing cell is positioned with a repeat accuracy of +/- 0.05 mm above the part. By this the sealing material can be applied through the mixing head dosing nozzle directly onto the part, precisely to its contour or in the middle of a groove. A maximum acceleration of 5 m/s² in the part radii is possible with this linear robot.

The feeding of parts to the dispensing cell is done user-friendly by means of a rotary indexing table with a 180° partitioning for an insertion and a work position turning within 1.5 seconds. For this semi-automatic part feeding the access of the insertion area at the cell is secured by a light grid. Alternatively, the parts are fed manually through the cell front, by a shuttle table or fully automatic via a transfer belt running through the cell.

Low-emission foam sealings

Another example is air-conditioning systems for cars. Polyurethane foam gaskets installed here ensure a leak-free seat of the



In order to ensure high-quality filter production, the adhesive and sealant must be precisely applied.



In order to avoid VOC (Volatile Organic Compound) emissions, the manufacturers of filters and air conditioning systems increasingly use low-emission adhesives and foam gaskets.

filter in the air intake duct, so that unfiltered air cannot flow into the car interior. In order to significantly reduce the load on the air with VOC (Volatile Organic Compound) emissions in the passenger compartment, polyurethane foam seal systems (Fermapor Low-Emission) are used for the tight sealing of filter housings in the car. They comply with the strict limit requirements of nearly all automobile manufacturers. Sonderhoff, for instance, fulfils the Daimler specification DBL 5452-13 which specifies for VOC emissions a target value of 100 micrograms and 250 micrograms for the fogging behaviour per gram of polyurethane. Too much VOC in the air often arises fogging. Soot, dust and / or aerosol particles in the air thereby move from

warm to colder zones where they are deposited. This can lead to condensation on the windshield or inside of car headlights. Another product characteristic of the polyurethane-based sealing systems are the antimicrobial sealing properties that prevent microorganisms and molds contaminating the sealings of air filters used for air conditioning systems or fresh air intake passages in cars.

Antimicrobial foam gaskets

The Institute for Air Hygiene (ILH Berlin) has tested the foam seals Fermapor K31-A-9020-17F and K31-A-9308-5-VP5-F as well as the potting product Fermadur-A-196- 4F with regard to their resistance to fungi and bacteria according to DIN EN ISO 846 (Evaluation of the action of microorganisms on plastics). The test results show that this sealing and potting material does not serve as a nutrient source for microorganisms. Special additives in the material formulation of the antimicrobial foam seals Fermapor K31 effectively protect the sealings of climate-technical components for air distribution, such as ventilation grilles, air filter, nebulizer and access locks, against attack by harmful microorganisms.

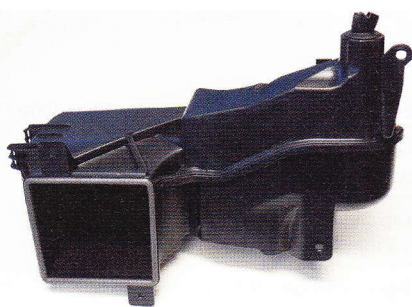
The heating, ventilation and air conditioning manufacturers demand for their seal-

ants and especially for the sealing and bonding of air filters special requirements in order to meet the hygiene requirements for HVAC systems according to VDI 6022. In particular air filters of these plants, which are to improve the climatic conditions of interiors, are often the cause of contamination of indoor air. Because accumulation of microorganisms on air filters is the cause of potent allergy risks when such contaminated air is inhaled by humans and animals. Especially at increasing temperatures, the concentration of microorganisms significantly increases and the fungal spores develop a higher vitality. Such conditions are a fertile breeding ground for germs which can cause infections in humans. Therefore, air conditioning systems need to be serviced regularly in order to work properly and ensure a good indoor climate. Here, among other things, the leakage-free seat of air filters is checked. //

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Plastic housings for fresh air intake to the car interior are equipped with a low-emission polyurethane foam gasket.