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**Standardized testing of filter systems regarding their separation efficiency in terms of allergenic particles and airborne germs****Johannes Mertl**

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Airborne germs and allergens in indoor air rank among the most important environmental risk factors for human health resulting in inflammatory diseases of the airways, such as asthma or allergic rhinitis. Besides medical treatment methods, the simple prevention of allergen contact is the most effective allergy protection strategy. As each person spends about 80% of his life in an indoor environment, air conditioning and ventilation devices have to meet very high standards regarding the separation of bioactive substances. Filters are generally tested using well defined mineral test dusts in order to obtain information regarding separation rates for certain particle sizes. However, from the separation rates for mineral dust particles, no direct conclusion on allergens and germs can be drawn. The separation efficiency of particularly fine, respirable particles is beside their particle diameter and shape, also defined by density and physicochemical properties. Numerous studies have shown that not only the intact pollen but also much finer particle fractions show an allergenic effect, which due to their potential for lung deposition, may even pose an added health risk to humans. In this context, particulates (fine dust) also seem to play an important role as carrier for allergenic proteins. However, filtration tests with dust from the environment are not sufficiently standardized. The OFI developed a test system that allows a standardized testing of filters regarding the separation of bioactive substances. Besides allergens from intact and fractured pollen, also allergenic proteins bound to particulates and spores of allergenic moulds (e.g. *Cladosporium cladosporioides*) can be used to classify filters regarding their separation rates. The test procedure, which is done in laboratory scale, was validated regarding its sufficiency to cover real life situations by up-scaling using air conditioning devices showing great conformity. Additionally, a clinical study with allergy sufferers was performed to verify analytical results.

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