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Focus on IFA's work

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Storage life of used respiratory filters

Problem

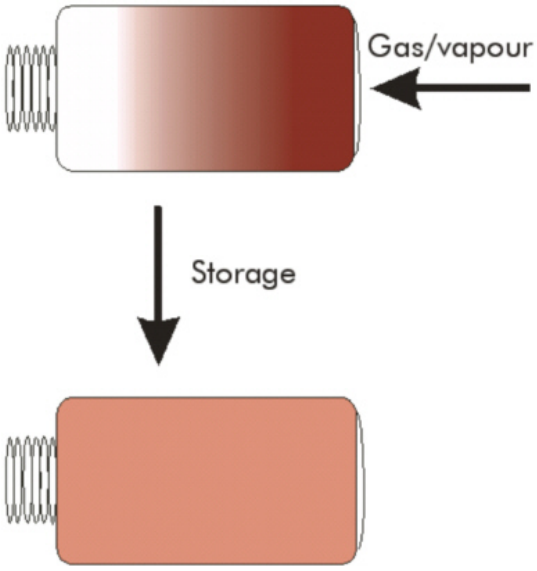
Gas or combination filters that have already been used are frequently re-used in filtering respirators. A longer storage period between uses can however give rise to problems, as hazardous substances retained in the filter can migrate through the activated carbon layer over time and thus break through it prematurely. For estimation of the risk associated with this effect, a study involving gas filters frequently used in the field was to be performed in order to obtain conclusive data.

Activities

In the laboratory, the relevant test gases were applied to the most widely used gas filter types for organic gases and vapours (Type A) on the one hand and for inorganic gases and vapours (Types B, E and K) on the other. Following a defined storage time, sample filters of each type were studied with regard to their residual capacity. Comparison with the expected service time without interim storage was to permit identification of premature breakthrough of the gas filter caused by the storage period.

Results and Application

Whereas on gas filters for inorganic gases and vapours, a 6-month storage period actually resulted in an improvement in performance in some cases, filters for organic gases and vapours exhibited a drop, in some cases considerable, in capacity.



The influence of storage upon substance distribution within gas filters

Substances with a low boiling point in particular resulted in premature breakthrough. Owing to further influences, such as the properties of the particular materials concerned, the design of the filter and the atmospheric humidity, the complex behaviour of the filters cannot readily be predicted. Suitable measurements must then be performed in order for reliable information to be obtained.

The information gained from the studies is reflected in warning information for users of gas-filtering respirators in the DGUV rules governing the use of respirators, DGUV Regel 112-190 (formerly BGR 190).

Area of Application

Typical areas of application for gas-filtering respirators, such as plants in the chemical and metal-working industries, refuse dumps, paint shops, and building trades

Expert Assistance

IFA, Division 3: Hazardous substances: handling – protective measures

Literature Requests

IFA, Central Division

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