

Performance Requirements for a Light-Weight Filter Self-Rescue Device

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ABSTRACT

In emergency situations, such as fires, industrial accidents or terrorist incidents, substances may be released which can cause harm by inhalation and/or eye irritation that impairs the ability to escape. Self-rescue devices must therefore protect lungs and eyes against foreseeable contaminants at foreseeable concentrations.

In defining relevant performance requirements for such devices it must be appreciated that devices that are not available cannot protect. Devices that are too heavy or too bulky to be carried on the person, in a handbag or briefcase, or too bulky to be securely stored in suitable numbers in public places such as offices, schools or transport vehicles, are unlikely to be available when required. It is therefore necessary to compromise between weight/size and performance so that suitable devices will be available when required. A device that will protect all wearers under all foreseeable use situations may be so complex that it may not be used correctly in emergency. It may therefore be impracticable to provide adequate protection for all persons in all foreseeable situations.

Likely contaminants in fire, industrial accidents and terrorist actions have been identified from published sources. Such data suggest that carbon monoxide is unlikely to be a problem in >90% of fire situations for exposure periods <20 minutes. Terrorists could use bulk materials such as liquid ammonia or chemical weapons such as Sarin, such as released by terrorists into the Tokyo underground in 1995.

It is concluded that a filter device which protects the eyes and lungs and against likely substances in concentrations up to 50 X TLV-TWA for >15 minutes against the substances specified in EN403 and EN405, other than carbon monoxide, could enable most adults to safely self-rescue from most emergency situations.