

Respiratory Self-Escape Devices: Imperative Need for Establishing a New Category of Respiratory Protective Equipment

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ABSTRACT

The paper covers the red-hot issue of providing protection against toxic chemical substances (TCS) to the civil population. To a great extent the solution of the problem depends on the availability of respiratory protective equipment (RPE) at the very moment an emergency situation (accident) or a terrorist act occur.

It is shown that at present the current system of providing protection to the civil population is mainly based on the use of traditional RPE (gas masks for civilians), which cannot be regarded as devices for permanent carrying on the person due to its big weight/size. As the TCS poisonous effect in emergencies is nearly immediate, the civilians, especially if gathered in public places, are actually prevented from using the protective devices efficiently. The paper focuses on that circumstance setting forth the rationale for the development and massive introduction of a compact and small-size filtering device with a hood for self-rescue, which can always be carried on the person. It has been underlined that such devices have a number of advantages, if compared to the gas masks for civilians, like their small mass/size parameters, ergonomic characteristics and can be regarded as a basic means for providing protection to the wearer during at least several tens of minutes, an extra time sufficient to leave the toxic area.

The core of the paper is thoroughly focused on how the technical and performance characteristics of self-escape devices have been chosen and substantiated. The grounds are selected following a number of foreseeable scenarios of terrorist acts, which can be perpetrated in public places involving the use of highly toxic chemical substances. Attention is paid both to closed structural ventilated or not ventilated premises and to outdoor areas.

These results serve as a basis for establishing the paper main theses. It is concluded that filtering devices with a hood for self-rescue can provide a protection declared by the manufacturer in emergency situations, at the levels in compliance with national and international standards and regulations currently in force, a task of highest priority nowadays.