

Development of a New Disposable Mask for Biological Threats

Esther Krasner, Moran Bodas and Guy Robin

Paper presented by Mrs. Esther Krasner,
Ministry of Defense, HaKiryat, Tel-Aviv, Israel
esther_krasner@mod.gov.il | +972-(0)3-6977651/2

Abstract

In the scenario of a biological threat, a crucial need exists for the protection of first responders against inhalation exposure. This requirement is usually achieved using disposable masks which are abundant in the market. However, recent studies, performed by leading research institutes during the 2009 pandemic influenza, suggest that these "off-the-shelf" product provide insufficient protection against airborne biological agents, partly due to inadequate adaptation of the mask to different facial features. This incompatibility met by some users can lead to breaches of the tight seal needed to provide the wearer with suitable respiratory protection.

In an effort to overcome this shortcoming, a joint U.S.-Israeli project was initiated for the development of a new design of disposable mask which would not only address user's requirements but would also be compatible with different facial features and provide the required seal.

The development process started with anthropometric measurements and requirements survey of potential users in order to deduce the specifications for the new design, followed by a wide study of different raw materials that could fit these specifications. Different design concepts were proposed and generated. These designs underwent analytical testing, e.g. protection factor measurement, and functional testing in which they were evaluated by medical personnel.

The final selected design offer a comprehensive solution to the abovementioned problem. This design maintains desired features of currently available products, such as user-friendliness, alongside ensuring the protection of users from biological threats with a high protection factor. The new, patent-pending mask is ready to be introduced to the industry.