

## **CBRN Escape Respirators**

### Safety and Health Information Bulletin

SHIB 08-29-03 (A)

This Safety and Health Information Bulletin is not a standard or regulation, and it creates no new legal obligations. The Bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with hazard-specific safety and health standards. In addition, pursuant to Section 5(a)(1), the General Duty Clause of the Act, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take reasonable steps to prevent or abate the hazard. However, failure to implement these recommendations is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.

### **Introduction**

OSHA has developed the information in this safety and health bulletin so that employers may provide their employees with the best possible protection from injuries and illnesses resulting from terrorist incidents. As concerns over the potential for future terrorist actions against the United States remain high, OSHA is committed to working with employers to strengthen their workplace planning and preparedness. Our goal also is to provide guidance to employers and employees on the larger concept of emergency management.

### **Emergency Planning and Preparedness**

Employers are responsible for providing a safe and healthful work environment for their employees. Planning for all types of emergencies including terrorist events has become increasingly important for employers and employees. To assist employers in developing an emergency action plan, OSHA encourages all employers to review the Evacuation Planning Matrix (<http://www.osha.gov/dep/evacmatrix/index.html>). This tool provides guidance to employers on how to assess a risk of a terrorist-initiated event, and provides notification, shutdown and isolation procedures, training and equipment guidelines, along with information on evacuating, sheltering, and accounting for employees.

## **Emergency Escape Masks**

Recently, a number of U.S. Government departments and agencies have purchased and distributed emergency escape masks to employees with the purpose of protecting against chemical, biological, radiological, and nuclear (CBRN) warfare agents. These escape masks have not gone through the NIOSH approval process at this time, and their performance in a CBRN event has not been fully validated. Our goal is to provide useful information to the users of these masks. It is not an endorsement, nor is it an objection to the use of the emergency escape masks. We want to encourage employers to provide meaningful training on the use and limitations of these devices. Described below is OSHA's guidance and our concerns related to workplace use of the emergency escape masks.

### **National Institute for Occupational Safety and Health (NIOSH) Approval**

In December 2001, NIOSH established criteria for certifying open-circuit, self-contained breathing apparatus (SCBA) for occupational use by emergency responders for protection against CBRN agents. Since then, SCBA models from several manufacturers have been approved. If responders are expected to participate in an emergency response or remain in the area of a chemical/biological weapon attack, then only a NIOSH-approved CBRN SCBA respirator would currently be allowed under OSHA's Respiratory Protection Standard. This requirement is especially critical since workers would be exposed to atmospheres that are largely unknown and could possibly present a hazard that is immediately dangerous to life or health (IDLH). Where the employer cannot identify or reasonably estimate the employee exposure, the Respiratory Protection Standard requires the employer to consider the atmosphere IDLH.

NIOSH began accepting applications on March 24, 2003 to test and evaluate full-facepiece air-purifying respirators (APRs) for use against CBRN agents. The evaluation criteria specify that the respirator must meet minimum requirements identified in applicable paragraphs of 42 CFR Part 84, requirements based on existing national and international standards, and special requirements for CBRN use. The special requirements testing provides for protections against 139 potential CBRN respiratory hazards, including chemical warfare agents and selected toxic industrial chemicals. Some of the masks presently on the market have been tested by SBCCOM (U.S. Army Soldier, Biological, and Chemical Command) against only three chemical/biological warfare agents. It is unknown how effective they will be against other test chemicals.

There are as yet no CBRN air-purifying escape respirators that are NIOSH-approved. NIOSH has initiated a standards development program that will result in new certification test criteria for CBRN air-purifying escape respirators by the end of this year. Guidance on these respirators will be found on NIOSH's website on their Respirator Topic page, <http://www.cdc.gov/niosh/respinfo.html>, as more information becomes available.

### **Use and Selection**

Most of the masks presently marketed are devices to be used for emergency escape from a chemical/biological warfare agent-contaminated area or release zone. These masks are currently not NIOSH-approved respirators, and OSHA regulations would

prohibit their use for employees who are required to respond to (rather than escape from) an incident.

Another area of concern is that such masks may offer little or no protection from many chemicals. Testing of these masks has been limited; some have been tested only to three or four substances at fairly low concentrations rather than the 107 chemicals that NIOSH believes this type of mask should be effective against. NIOSH is currently conducting benchmark evaluations as part of the effort to determine potential certification test concentrations.

OSHA's Respiratory Protection Standard, 29 CFR 1910.134 (or its State Plan equivalent), mandates that all employees required to wear a respirator be included in a written respiratory protection program that details workplace-specific procedures. Key procedures which must be addressed in the program are the proper selection of respirators, medical evaluation of employees required to wear the respirators, fit testing, proper use and maintenance of respirators, training, and an annual evaluation of the program. The standard requires that only NIOSH-approved respirators be used.

However, emergency escape masks may allow people to safely escape from an incident where their work area has been contaminated by chemical or biological agents. In this case, when such use is voluntary on the part of the employees and not required by their employers, the requirements of the voluntary-use provisions (i.e., paragraph (c)(2)) of the Respiratory Protection Standard would apply. This paragraph does not require that all elements of the Respiratory Protection Standard be implemented for those whose use of respirators is voluntary and the masks are used for escape only. Instead, these employees would need to be provided the information in Appendix D of the standard and the employer would need to establish and implement those elements of a written program that would ensure that the use of the respirator did not present a health hazard to the user. Employers would also need to establish and implement procedures for the proper use of these escape masks. Escape hoods/masks must be used **only** for escape.

## **Training**

Training is necessary to ensure that the respirator itself does not become a hazard. Even when the use is voluntary, it is essential that workers be thoroughly trained in the proper use of escape masks. In addition, workers need to know the conditions that limit use of the escape mask, e.g., these masks neither supply clean breathing air nor filter carbon monoxide, so their use in a fire or other oxygen-deficient atmosphere would not provide the necessary protection.

Training should include the opportunity to actually wear the escape mask. For example, one manufacturer cautions that improper use of the nose clip can cause a negative pressure in the hood and render the mask ineffective. In a building evacuation, it may be necessary to move quickly. The physical condition of the person with regards to respiratory rate, heart rate, and facial perspiration may compromise mask performance. Training should be done initially, and then repeated at least annually.

At least one manufacturer advertises that their masks have been found effective for over an hour for several chemical agents. However, effectiveness depends on such variables as humidity, temperature, and amount of exertion by the user. This

advertisement may give some employees a false sense of security (and lull them into thinking they can linger in the area) since some manufacturers make no mention about a more critical variable: the concentration of the chemical in the air. Employees should be taught to don the mask properly and leave the area immediately.

Another area of concern is that although several of the available masks were tested against a few chemical warfare agents, they may offer little or no protection from many of the other chemicals likely to be used by terrorists. Many experts believe a terrorist attack would more likely involve a large quantity of other, more readily obtained, industrial chemicals such as chlorine or ammonia, rather than one of the chemical warfare agents. Employees need to know the location of, and how to access, their masks. Accordingly, escape masks should be readily available to employees. If they are kept in an inaccessible location, e.g., a locked closet, it may be more effective to quickly retreat to a safe area without a mask.

### **Skin Protection**

Masks do not offer general skin protection. If there were a chemical attack, no mask or respirator alone would be enough to protect employees since many chemical warfare agents can also penetrate through the skin. Consequently, there will be a continued risk to employees who remain in the release area due to skin absorption of the chemical agent. In cases where employees are required to remain in the area of release, full-body chemical protection, such as chemical suits, would be needed.

### **Poor Communication Capability**

The design of many escape masks make communication difficult. Wearing a nose clip and a mouth bit, or speaking through a nose cup, prohibits or strongly impairs speech. Hoods that cover the wearer's head may also impair hearing.

We hope you find this information helpful. If you have any further questions, please feel free to contact our Directorate of Enforcement Programs at (202) 693-2100.