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Interim Guidance on Using CBRN Canisters for activities other than response to terrorist events

NIOSH currently approves full facepiece, tight-fitting, air-purifying respirators (APR) with chemical, biological, radiological, and nuclear (CBRN) protection, commonly referred to as 'CBRN APR', or 'CBRN gas masks.' This interim guidance provides recommended guidelines for CBRN APR use in applications other than terrorist events (e.g. industrial and hazmat response, natural disaster response, etc.).

The NIOSH approval requirements for the CBRN APR were developed to address the unique needs of emergency responders in CBRN terrorist environments. However the unique protective qualities of the canister make it a **'dual purpose'** canister, allowing it to also be used to effectively protect against the same toxic industrial chemicals/materials that may be encountered in non-terrorist environments (industrial and disaster site environments) as well as terrorist environments. The CBRN protection incorporates the following toxic industrial chemical or particulate protections: **Organic Vapors** (OV), **Acid Gases** (AG), **Base Gases** (consisting of Allyl amine, Ammonia, Dimethyl hydrazine, 1,2 , Methyl hydrazine), **Hydrides** (consisting of Arsine, Germane, Phosphine, Stibine), **Nitrogen Oxides** (consisting of Nitric acid, fuming Nitric acid, Nitrogen dioxide, Nitrogen tetraoxide, and Nitrogen trioxide), **Formaldehyde** and **Particulates** (P100). The P100 particulate protection includes protection against airborne bacteria and viruses. The CBRN canister capacity levels for the various protections were developed to meet the anticipated scenario needs for a likely terrorist event, and therefore differ from the capacities found in canisters and cartridges normally used for industrial environments, in industrial or disaster site environments

As with all air-purifying elements (filters, canisters and cartridges), CBRN canisters' time of use is limited by their adsorption capacity and use parameters, such as the type of substance being removed, the concentration of the substance being removed, the ambient temperature and humidity at the time of removal, carbon porosity, and the air-flow rate. A *change schedule*, sometimes called a 'change-out' schedule, is the calculated time interval for protection against gas/vapors, after which a used canister is replaced with a new one. An appropriate change schedule assures that the canister will be changed before the downstream (inside the respirator) concentration exceeds a predetermined breakthrough concentration. The change schedule also must be convenient to implement and enforce. The OSHA Respiratory Protection Standard [29 CFR 1910.134] requires that employers implement change schedules for canisters where end-of-service-life indicators (ESLI) do not exist or are not appropriate for the work environment. Presently, CBRN APR canisters are not approved with ESLIs. The respirator manufacturer should be contacted for appropriate guidance on a CBRN canister change schedule for the intended use. Once the change schedule has been determined, it must be implemented by the user.

As with all NIOSH-approved respirators, CBRN APR should be used in accordance with the NIOSH cautions and limitations of use specified on the 'matrix style' approval label which accompanies each respirator. CBRN APR use is restricted to use against characterized exposures and for environments which contain adequate oxygen to support life (greater than or equal to 19.5% by volume). All CBRN canisters should be changed immediately if breathing becomes difficult due to clogging/loading by particulates. Canisters should also be changed immediately if they become damaged. All CBRN canisters should be changed in a clean area, free from contamination.

The CBRN APR can only be used in its approved configuration.

Maintenance

A CBRN APR respirator must be properly maintained and stored in accordance with the manufacturer's instructions, as a condition of use for the NIOSH CBRN APR approval. CBRN canisters used for response to terrorist events should remain in their sealed packaging until needed for use. A CBRN APR must be restored, after use, to the manufacturer-specified storage packaging configuration for the NIOSH approval to remain valid for that unit. The CBRN APR must always be assembled in the NIOSH-approved configuration specified by the 'matrix style' approval label and maintained in accordance with the manufacturer's recommendations.

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