U.S. ARMY PUBLIC HEALTH CENTER

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Cleaning Refrigerated MILVANs after Mortuary Use

Background. The same model refrigerated Military-Owned Demountable Containers (MILVANs) are issued to and used by field food service operations, field medical units, and Mortuary Affairs units. In an extreme emergency, refrigerated MILVANs assigned to food service units or medical units can be temporarily used to hold human remains. Under no circumstances should human remains and food be stored together in a MILVAN.

The following procedures apply to food refrigerated MILVANs that were used during an emergency to hold human remains or items contaminated with blood or other potentially infectious materials (OPIM) and are now being returned to service with field food service units.

Prior to returning the refrigerated MILVAN to use for the transportation of food, it must be—

- Free of all visible soil.
- Free of blood or body fluids.
- Free of all pathogenic and most non-pathogenic bacteria, molds, and spores.
- Free of odors that remain from use as a morgue or holding OPIM.

The most difficult task is to eliminate any odors. Odors may remain even after thorough cleaning and disinfection. In these cases, the U.S. Army Public Health Center (APHC) recommends the units not be returned to use as a food refrigerator.

Personal Protective Equipment (PPE). Personnel assigned to clean and disinfect MILVANs must be trained consistent with the OSHA's Bloodborne Pathogens standard, and they must know the local disinfection protocols and safe work practices including, but not limited to, universal precautions, hand-hygiene, and the disposal of regulated medical waste (RMW). Before starting the cleaning and disinfecting process, personnel must don PPE to include gloves, splash-resistant safety goggles, protective gowns/coveralls, and chemical-resistant safety boots. A surgical mask or a full-face shield, head cover, and shoe covers must be worn when splashing is likely or when a mist/aerosol/particulate can be generated. Adequate ventilation must be provided in confined areas.

Cleaning and Disinfecting Procedures.

a. Shut off the refrigeration unit.

b. Power wash (with hot water) the inside and the outside of the refrigerated MILVAN using a powered sprayer with detergent. Clean the inside of the refrigerated MILVAN, paying particular attention to its joints and seams. Start power washing from the ceiling, down to the walls and floor, and finally the doors. After washing, rinse all surfaces with warm water.

c. Cleaning must include the condenser, cooling fins, and, if present, any air ducts or fans both inside and outside the refrigerated space.

d. Steam cleaning is an acceptable alternative to power washing, provided additive-free steam is used. Special attention is needed to ensure all residues/debris are adequately removed from the treated surfaces.

e. After the refrigerated MILVAN has been power washed and is clean, disinfect all surfaces including any air vents and internal cooling fins using a U.S. Environmental Protection Agency (EPA)-registered disinfectant or a 500 parts-per-million chlorine solution. This solution is made by adding 1/4 cup of 5.25–6% unscented household bleach to 1 gallon of water. A stainless steel sprayer is ideal for spraying the chlorine solution on the

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ceiling, walls, and floor. The surfaces should be thoroughly wet for a minimum contact time of at least 1-minute to ensure proper disinfection, and then followed by a clear water rinse to remove any remaining chlorine residue. Chlorine is very corrosive and failure to rinse the residual will cause metal surfaces to rust. For situations requiring disinfection for a target pathogen such as SARS-COV-2 (for COVID), Ebola, or Norovirus, among others, refer to the EPA website (https://www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants) to find the list of products proven to be effective for the specified pathogen. If a product other than chlorine bleach is used, follow the manufacturer's instructions on the label for contact time (dwell time) and rinsing. Allow surfaces to air dry following disinfection. NOTE: The condenser coils should be power washed with detergent only and not disinfected with the chlorine solution, as the chlorine solution is too corrosive to the soft metal.

f. Remove the flooring if they are removable, and then power wash or steam clean and disinfect them outdoors using the procedures outlined above. Permanent flooring must be cleaned and disinfected following procedures as outlined above.

g. Allow the MILVAN to thoroughly air dry before closing. When completely dry, close the MILVAN and keep it closed for a minimum of 24 hours. After 24 hours, open the MILVAN and determine if any residual odors are detected. A "disinterested officer" should determine if there are any residual odors. If odors persist after cleaning and disinfection, serious consideration should be given NOT to return the MILVAN for use as a food refrigerator.

h. Test the container for bacteria (e.g., total coliform and *e.coli* bacteria) before using it for food storage.

i. Contact the installation industrial hygienist for PPE requirements for personnel working inside the MILVAN, including respiratory protection, head cover, coveralls, gloves, and boots.

Retrograde Washdowns. Additionally, at the completion of operations outside the continental United States, retrograde washdowns are necessary to meet U.S. Department of Agriculture requirements to safeguard United States agriculture and natural resources from risks associated with the entry, establishment, or spread of animal/plant pests and noxious weeds. The MILVANs should be cleaned to be free of visible dirt, insect infestation, or prohibited plants or animal material. Performance of these washdowns is addressed in the Armed Forces Pest Management Board Technical Guide No. 31, *Operational Washdown and Agricultural Inspection Preparation for Military Conveyances and Equipment* (December 2021). (http://www.acq.osd.mil/eie/afpmb/docs/techguides/tg31.pdf)

Liquid Waste Collection and Disposal. APHC recommends that the unit's Environmental Science and Engineering Officer or Installation Department of Public Works provide guidance to ensure any discharges of detergent, disinfectant, or rinse water from the cleaning and disinfecting procedures are managed according to local environmental regulations. For example, establish a method such as the use of a portable pool to collect any liquid waste run-off. These liquids are not biomedical waste; however, depending on the location of the MILVAN, they may not be suitable for release into the ground or storm drains without neutralization due to the disinfectant and detergents used. Treatment is permissible to bring the liquid to a neutral pH and to dilute detergent/surfactants in the liquid waste.

Reference. APHC. 2015. Technical Guide 195A, *Safety and Health Guidance for Mortuary Affairs Operations: Infectious Materials Handling*.