DEPARTMENT OF THE ARMY
US ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND MD 21010-5403

MCHB-TS-TTE 8 March 2007

MEMORANDUM FOR Soldier, C3 and IEW Division (CSTE-DTC-TM-S/ Mr. Russell Kilbane), U.S. Army Developmental Test Command, 314 Longs Corner Road, Aberdeen Proving Ground, MD 21005-5055

SUBJECT: Toxicity Clearance for the Gaco Western Polyfoam™ System 193

1. References:

a. Memorandum, U.S. Army Developmental Test Command, CSTE-DTC-TM-S, 1 March, 2007, subject: request for Toxicity Clearance for the Gaco Western Polyfoam™ System 193.

b. Materiel Safety Data Sheet (MSDS), Polyfoam A & B, Gaco Western, Inc., 521 Biddle Street, Waukesha, WI 53186, 1 November 2005.

c. E-mail, U.S. Army Developmental Test Command, (CSTE-DTC-TM-S), Mr. Russell Kilbane, 1 March 2007, subject: Polyfoam MSDSs.

d. Website, Hazardous Substances Data Bank (HSDB), National Library of Medicine, Bethesda, Maryland (electronic version), TOXNET System. Available at http://toxnet.nlm.nih.gov (cited 2 March 2007).

e. Product Data Sheet, Gaco Western Polyfoam™ System 193, Gaco Western, Inc., 521 Biddle Street, Waukesha, WI 53186, December 2005.

f. Product Data Sheet, Gacoflex A-30 Fast Dry, Gaco Western, Inc., 521 Biddle Street, Waukesha, WI 53186, February 2007.

g. Spray Guide, Acrylic, Gaco Western, Inc., 521 Biddle Street, Waukesha, WI 53186, 2006.

2. Background.

a. The Test Manager, Soldier, C3 and IEW Division of the Directorate of Test Management has requested that a Toxicity Clearance be performed for the Gaco Western Polyfoam™ System 193 (reference 1a). The manufacturer of this system is Gaco Western, Inc., 521 Biddle Street,

Waukesha, WI 53186 (reference 1b). The Polyfoam™ System is a consumer-off-the-shelf item designed to improve the insulation of military tent systems over current capabilities (reference 1a). The Polyfoam will then be sprayed with a silicone enhanced elastomeric coating for improved weatherability (reference 1c).

b. Polyfoam is a two-part polyurethane spray foam system that contains 4,4' Diphenylmethane diisocyanate (monomeric MDI) (50 percent) and 1,1,1,3,3-Pentafluoropropane (6-12 percent) (reference 1b). Unreacted droplets of monomeric MDI are classified as moderately toxic and can be irritating to the skin, eyes, and respiratory tract. Inhalation of these droplets may cause damage to the mucous membranes and allergic sensitization of the respiratory tract as well as induce asthma in human beings. Monomeric MDI is not classifiable as to its carcinogenicity in humans (Group 3) based on inadequate evidence in humans and limited evidence in experimental animals. The Occupational and Safety Health Administration (OSHA) Permissible Exposure Limit is 0.02 ppm (ceiling limit). The American Conference of Governmental Industrial Hygienists, Inc. (ACGIH) Threshold Limit Value (8 hour time weighted average) and National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (10 hour time weighted average) for monomeric MDI is 0.005 ppm (references 1b&1d). The toxicological properties of 1,1,1,3,3-Pentafluoropropane have not been fully evaluated, however the vapors from this product have the ability to displace enough air for it to be classified as an asphyxiant (reference 1b).

c. The requestor of this Toxicity Clearance has stated that all application, clean-up, and storage operations involving the Polyfoam will be performed by trained contract personnel, so personal protective equipment will not be discussed for these operations (reference 1a). However, if spraying operations will occur in the vicinity of military personnel, certain precautions must be taken. The manufacturer has stated that no unauthorized personnel should be within 150 feet of any outdoor spraying operation. In addition, if weather conditions warrant, windbreaks should be erected to confine the spray-mist within the work zone. If spraying operations are occurring indoors, unauthorized personnel should maintain a safe distance from all ventilation outlets (reference 1e). The American Conference of Governmental Industrial Hygienists reported an incident occurred in which men who worked 60-120 feet from a MDI foam-spraying operation developed symptoms, including asthmatic breathing, retrosternal soreness, constriction of the chest, cough, retrobulbar pain, depression, headache, nasal discharge, and insomnia. The workers performing the spraying operation wore full protective clothing and air-supplied respirators and were unaffected (reference 1d). The same guidelines discussed above for unauthorized personnel during spray operations also apply for the silicone coating (references 1f&1g).

3. Recommendations and Conclusions.

a. No application, clean-up, or storage operations should be performed by military personnel

b. Ensure that adequate no-entry work areas are designated and enforced during spraying operations. If weather conditions warrant, construct windbreaks to prevent mists from drifting outside of the spraying work area.

c. The Polyfoam must be allowed to fully cure before allowing military personnel into the work area so that established exposure limits are not exceeded.

d. Based upon a review of the MSDS, product data sheets, and information provided by the sponsor, a Toxicity Clearance is granted for the use of Gaco Western Polyfoam 193 and Gacoflex A-30 Fast Dry Coating as insulation on military tent systems.

4. Disposal guidance for Gaco Western Polyfoam 193 is enclosed.

5. Point of contact for this action is Mr. Lee Crouse who can be reached at DSN 584-5088, commercial (410) 436-5088, or via e-mail at Lee.Crouse@us.army.mil.

FOR THE COMMANDER:

Carol A. Bossone

Encl

CAROL A. BOSSONE
LTC, VC
Director, Toxicology

DISPOSAL GUIDANCE ON GACO WESTERN POLYFOAM SYSTEM 193

1 References:

a. Electronic message USACHPPM, (MCHB-TS-TTE), Mr John Houpt, February 22, 2007, requesting disposal information for the item described above.

b. Title 40 Code of Federal Regulations (CFR) Parts 260 through 279.

c. Material Safety Data Sheet (MSDS), Gaco Western Polyfoam A & B, November 1, 2005.

2. The following is in response to the reference.

a. Based on information found in the MSDS (reference 1c), neither of the components (A&B) would be classified as hazardous waste (reference 1b). While Component A will react with water, it is not a violent reaction and does not form toxic gases in quantities sufficient to present harm to human health and the environment.

b. Reuse/reissue options should be explored for unused quantities of Gaco Western Polyfoam System 193 (both A&B components). Because both components A&B are liquids and could potentially migrate into ground water if disposed in a landfill, unused materials should be disposed in a municipal waste incinerator (contingent upon the facility's operating permit). The incinerator should be of greater than 50 tons per day capacity and should be equipped with appropriate air pollution control devices. A hazardous waste incineration facility would also be appropriate for the disposal of these items.

c. States and/or counties often have additional requirements for characterizing solid wastes. For this reason, it is recommended that generators of this material contact the environmental personnel at their facility for definitive disposal information.

3. Questions pertaining to the information in this memorandum can be directed to Mr. Richard Price. He may be reached at 410-436-5231.

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