INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION

ANSI/ISEA 113-2013

American National Standard for Fixed and Portable Decontamination Shower Units

ANSI/ISEA 113-2013

Revision of ANSI/ISEA 113-2008

American National Standard for
Fixed and Portable Decontamination Shower Units

Secretariat

International Safety Equipment Association

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American National Standards Institute, Inc.

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Foreword (This Foreword is not part of American National Standard ANSI/ISEA 113-2013)

Since the devastating 9-11 attacks on the USA, portable hazmat decontamination shower systems of all types have appeared in the North American marketplace - from homemade plastic and saw horse showers to single user pneumatic and metal framed shower units and multiple line 3- and 4- stage mass casualty shower systems. While most products were well-intentioned, no actual standard in terms of flow rates, water stream, shower head placement, and other pertinent performance characteristics existed prior to the development of this standard.

This second edition of ANSI/ISEA 113 incorporates changes in an effort to clarify the testing procedures for decontamination shower equipment and to clearly identify the requirements for each equipment type by placing them in separate sections. One notable change to the document is the removal of performance requirements for equipment to provide a flow that is non-injurious to the end-user. It is recognized that validating the requirement to be non-injurious is subject to interpretation as there are no current criteria to qualify this characteristic. Additionally, the upper parameters for equipment operational pressure have been removed as the document is a minimum product-performance oriented standard The standard was prepared by the Emergency Eyewash and Shower Group of the International Safety Equipment Association, whose members are thoroughly knowledgeable in the design, set up, and use of this important safety equipment. Current members of the Group include: Bradley Corporation, Encon Safety Products, FSI North America®, Guardian Equipment, Honeywell Safety Products, Hughes Safety Showers, Prevor, Inc., Sellstrom Manufacturing Company, Speakman Company, Therm-Omega-Tech and VisionAid.

This standard is not meant nor designed to offer direction to professionally trained first responders in how these shower systems shall be deployed or placed at a scene. It is also important to note that this standard does not address the shower duration for a victim. The incident commander or other person overseeing the situation must determine the length of decontamination taking into consideration the contaminants involved, equipment availability, weather conditions and other influencing factors.

Training in the care, use, and maintenance of all portable hazmat decontamination shower systems should be followed in accordance with the actual manufacturer's instructions.

Although not specifically addressed in this standard, consideration should also be given to the proper disposal of waste flushing fluids after use. The use of waste pumps and bladder tanks to pump out and hold the “dirty water” for removal to an authorized disposal site, along with outside environmental conditions are some but not all of the considerations. Always consult local, state, and federal regulations that may apply.

Suggestions for the improvement of this standard are welcome. They should be sent to the ISEA, 1901 N. Moore Street, Suite 808, Arlington, VA 22209.

This standard was processed and approved using consensus procedures prescribed by the American National Standards Institute. The following organizations were contacted prior to the approval of this standard. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

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FSI North America
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American National Standard for Fixed and Portable Decontamination Shower Units

1. Scope

This standard is intended for use by first responders and receiving medical facilities for the initial decontamination of victims of contamination and possible exposure. This standard addresses classification and testing criteria for fixed and portable showers designed for decontamination facilities. The standard establishes minimum performance requirements for equipment capable of decontaminating one or more persons at the same time.

2. Purpose

This standard provides uniform minimum requirements for the performance, use, maintenance and training for fixed and portable decontamination showers.

3. Compliance

3.1 Fixed decontamination shower units shall meet the performance and design requirements of Section 5.

3.2 Portable decontamination shower units shall meet the performance and design requirements of Section 6.

4. Definitions

fixed decontamination shower unit: Primary decontamination device not intended to be portable, which is normally permanently installed to an existing flushing fluid supply.

flushing fluid: Potable water, preserved water, preserved buffered saline solution or other medically acceptable solution manufactured and labeled in accordance with applicable government regulations. (See Appendix A3, A4).

multiple-user unit: Device designed and intended for use by two or more individuals simultaneously.

portable decontamination shower unit: Primary decontamination device normally intended for temporary installation, which can be transported to the site of use.

potable water: Water that is suitable for drinking.

shower station: Decontamination device within a multiple-user unit that is intended for use by one person.

single-user unit: Device designed and intended for use by a single individual at a time.

tepid: A flushing fluid temperature conducive to promoting decontamination. A suitable range is 16 – 38º C (60 - 100 º F).

5. Fixed Decontamination Shower Units

5.1 Performance and Design Criteria

5.1.1 Fixed decontamination shower units shall be constructed of materials that will not corrode in the presence of the flushing fluid or corrosive materials with which they may come in contact during normal use.

5.1.2 Fixed decontamination shower units shall deliver flushing fluid a minimum at of 75.7 liters per minute (20 gpm) per shower station.

5.1.3 Control valves shall go from “off” to “fully-opened” in 1 second or less and shall be resistant to corrosion. Manual or automatic actuators shall be easy to locate and readily accessible to the user.

5.1.4 Manufacturer’s instructions shall provide information on the effective spray pattern for their products within the minimum

specified flow criteria. The center of the spray pattern shall be located at least 40.6 cm (16 in.) from any obstruction. The flushing fluid shall be dispersed throughout the pattern effectively drenching the entire body.

5.1.5 Fixed decontamination shower units shall meet the performance criteria at a minimum operating pressure of 206.8 kPa (30 psi) at the point of discharge.

5.1.6 Testing shall be conducted in accordance with Section 5.2 to verify pattern and flow rate requirements.

5.2 Testing Procedures

(1) Connect a flow meter to the shower unit to be tested, or provide other means of measuring flushing fluid flow.

(2) Connect the shower per the manufacturer's specifications to a flushing fluid supply at a flow pressure of 206.8 ± 13.8 kPa (30 ± 2 psi).

(3) Open the valves to all shower stations in the shower unit and verify that they stay open.

(4) Determine that flushing fluid is substantially dispersed throughout the spray pattern specified in Section 5.1.4. Verify that the flow rate is a minimum of 75.7 liters per minute (20 gpm) from each shower station simultaneously.

5.3 Installation

5.3.1 Fixed decontamination units shall be installed in accordance with the manufacturers' instructions.

5.3.2 If shut off valves are installed in the supply line for maintenance purposes, provisions shall be made to prevent unauthorized shut off.

5.3.3 Fixed decontamination shower units shall be installed to deliver tepid flushing fluid.

6. Portable Decontamination Shower Units

6.1 Performance and Design Criteria

6.1.1 Portable decontamination shower units shall be constructed in such a manner that they can continue to operate as designed when configured with all supporting accessory items (i.e., air heaters, air coolers, water heaters) when exposed to environmental elements such as high wind speeds and high and low extreme temperatures, all as specified by the manufacturer. A dual means shall be provided for securing portable shower units to the ground.

6.1.2 Portable decontamination shower units shall be capable of delivering flushing fluid at a minimum of 9.4 liters per minute (2.5 gpm) per shower station with no obstructions between the user and the showering fluid.

6.1.3 Control valves shall go from "off" to "fully-opened" in 1 second or less and shall be resistant to corrosion. Manual or automatic actuators shall be easy to locate and readily accessible to the user.

6.1.4 Manufacturers' instructions shall provide information on the effective spray pattern for their products within the minimum specified flow criteria. At a minimum, all installed spray nozzle heads shall be deployed such that the entire body is thoroughly drenched over the shower period.

If multiple shower heads are used, the topmost shower head shall be a minimum of 182.3 cm (72 in.) above the shower floor level to allow the entire head area to be easily showered. Subsequent shower heads shall be at approximately 121.9 cm (48 in.) above the shower floor for decontamination of the chest and back area; and at approximately 76.2 cm (30 in.) above the shower floor area for decontamination of the lower body, legs and feet.

6.1.5 All hanging trigger or lever activated spray devices with shutoffs shall have a minimum 5-foot (1.5 m) length hose such that the user can effectively reach and decontaminate either their own entire body or such that the first responder can properly

decontaminate an entire body of a victim on a stretcher on a conveyor in the shower area.
6.1.6 Portable shower units shall meet the performance criteria at a minimum operating pressure of 310.3 kPa (45 psi) at the point of discharge.

6.1.7 Portable shower units shall be capable of using tepid flushing fluid. Tepid flushing fluid shall be used whenever practical.

6.1.8 Testing shall be conducting is accordance with Section 6.2 to verify pattern and flow rate requirements.

6.2 Testing Procedures

(1) Connect a flow meter to the shower unit to be tested, or provide other means of measuring flushing fluid flow.

(2) Connect the shower per the manufacturer's specifications to a flushing fluid supply at a flow pressure of 310.3 ± 13.8 kPa (45 ± 2 psi).

(3) Open the valves to all shower stations in the shower unit and verify that they stay open.

(4) Determine that flushing fluid is substantially dispersed throughout the spray pattern specified in Section 6.1.4. Verify that the flow rate is a minimum of 9.4 liters per minute (2.5 gpm) from each shower station simultaneously.

7. Maintenance, Care, Training and Storage

7.1 Manufacturers shall provide deployment, operation, inspection and maintenance instructions with decontamination equipment and accessories. Instructions for all decontamination equipment shall be readily accessible to maintenance and inspection personnel.

7.2 Fixed shower units shall be activated weekly for a period long enough to verify operation and ensure that flushing fluid is available.

7.3 Portable shower units shall be deployed every 3 months to ensure proper operation.

7.4 Where the possibility of freezing conditions, and/or high humidity or heat exists, adequate protection and storage of all equipment shall be utilized. Consult manufacturers for instructions.

7.5 Any worker required to set up or operate decontamination showers shall be instructed in the location and proper use and care of the equipment.

Appendix

This appendix is not part of American National Standard ANSI/ISEA 113-2013, but is included for information only.

A1. Delivered Flushing Fluid Temperature

Continuous and timely irrigation of affected tissues for the recommended irrigation period are the principal factors in providing first aid treatment. Providing flushing fluid at temperatures conducive to use for the recommended irrigation period is considered an integral part of providing suitable facilities. Medical recommendations suggest a flushing fluid at tepid temperatures be delivered to affected chemically-injured tissue. Temperatures in excess of 38°C (100°F) have proven to be harmful to the eyes and can enhance chemical interaction with the eyes and skin.

While cold flushing fluid temperatures provide immediate cooling after chemical contact, prolonged exposure to cold fluids affects the ability to maintain adequate body temperature and can result in the premature cessation of first aid treatment. Recent information indicates that a temperature of 16°C (60°F) is suitable for the lower parameter for tepid flushing fluid without causing hypothermia to the equipment user.

A2. Containment

While it is recognized that there may be environmental concerns associated with the run-off and containment of any flushing fluid that becomes contaminated when treating a victim, such procedures should be established in consultation with authorities and applicable local, state and federal regulations. Several published resources are available including:

- *NFPA Supplement 10, Guidelines for Decontamination of Fire Fighters and Their Equipment Following Hazardous Materials Incidents* Pg.14,, National Fire Protection Association, 1997

- *Rapid Access Mass Decontamination Protocol,* The Capitol Region Metropolitan Medical Response System, Hartford, CT, January, 2003

- Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C § 9601 et seq. (2006)

A3. Alternative Decontamination Solutions and Systems

If alternative decontamination solutions or systems are utilized, appropriate volumes and/or flow pressure rates should be used to obtain effective decontamination. Performance should meet manufacturers' specifications with applications to personnel based on Sections 5.1.4 and 6.1.4 such that the entire body of the victim is thoroughly decontaminated.

A4. Flushing Fluid Quality for Portable Units

For portable systems designed to utilize water, ideally potable water should be used. However, it is recognized that there may be situations where potable water is not readily available. When this is the case, any acceptable and available flushing fluid may be used.

A5. Removal of Decontaminated Clothing

Where possible and feasible portable decontamination showers should be supplied to provide private undress, shower, rinse, and redress areas per victim. It is further understood that all victims should remove all contaminated clothing prior to showering if at all feasible and store/dispose of said clothing in sealed containers such as over pack drums. All first responders dressed in sealed Level A type chemical

suit clothing should decontaminate the entire suit during the decontamination process prior to chemical suit removal. Additional information related to acceptable decontamination protocols is available from numerous resources including:

- OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances, January 2005

- Guidelines for Mass Casualty Decontamination During a Terrorist Chemical Agent Incident (prepared by U.S. Army Soldier & Biological Chemical Command), January 2000

- Guidelines for Cold Weather Mass Casualty Decontamination During a Terrorist Chemical Agent Incident (prepared by U.S. Army Soldier & Biological Chemical Command), January 2002