

Chapter 9

INDIVIDUAL PROTECTIVE EQUIPMENT

This overview is divided into four sections: (1) individual protection, (2) individual decontamination, (3) detection and alarms, and (4) patient protective equipment. For further information on these items, see the current technical manual for each piece of equipment.

Individual Protection

This section includes standard “A” individual protective equipment (IPE) issued to each soldier depending on his or her military occupational specialty and consisting of the following items:

- M40A1 Chemical Biological Field Protective Mask
- M42A2 Chemical Biological Combat Vehicle Protective Mask
- M45 Air Crew / Land Warrior Chem-Bio Mask System
- MCU-2A / P Protective Mask
- M50 Field Protective Joint Service General Purpose Mask (JSGPM)
- M51 Combat Vehicle Joint Service General Purpose Mask (JSGPM)
- M53 Chemical-Biological Protective Mask
- Joint Service Lightweight Integrated Suit Technology (JSLIST)
- Chemical / Biological / Radiological / Nuclear Lightweight Overboots Alternative Footwear Solution (AFS)
- JSLIST Joint Block 2 Glove Upgrade (JB2GU)

M40A1, M42A2, and M45 Masks

The M40A1, M42A2, and M45 (serial numbers TM-3-4240-346-10 and TM-3-4240-348-10) are three variations of a protective mask sharing many of the same design characteristics, capabilities, and features. Each mask has been designed for very specific mission requirements, such as aircraft or combat vehicle operation. Technical information on overall mask operations will be covered here.

These protective masks provide users with respiratory, eye, and face protection against chemical and biological agents and radioactive fallout particles. If a mask is properly fitted and worn correctly, it provides a gas-tight face seal, which prevents contaminated air from reaching the wearer's respiratory, ocular, and dermal systems. These masks have not been designed for use in toxic industrial chemical (TIC) environments and are known to be ineffective against chemicals such as ammonia and carbon monoxide. For this reason, personnel exposed to unidentified TICs should consider the masks as escape devices only, and leave the contaminated area as rapidly as possible. The masks are also not suitable for confined spaces where oxygen is insufficient to support life.

Each mask is constructed of silicone rubber with an in-turned sealing surface so that it can form a comfortable seal on the wearer's face, an external second skin for additional protection. A binocular eye lens system is used for improved vision, with clear and tinted "outserts" to provide eye protection against lasers and low speed fragmentation. Optical inserts may be used if the user requires corrective lenses. An elastic head harness secures the mask to the user's face. Other common features include front and side "voicemitters" for face-to-face and phone communications, and each mask is furnished with drinking tubes to allow for hydration.

A key design feature of each of the discussed protective masks is the use of a standard C2A1 NATO threaded filter canister. The canister is externally mounted and may be mounted on the left or right side of the face piece, depending on the preference of the user. The C2A1 canister must be disposed of in accordance with state and local environmental laws.

MCU-2A/P Mask

The MCU-2A/P series mask (Air Force Technical Order 14P4-15-1) is designed to protect the face, eyes, and respiratory tract of the user from tactical concentrations of chemical and biological agents, toxins, and radioactive fallout particles. The mask has a unimolded, silicone rubber face piece and a single flexible lens bonded onto the face piece. The large lens gives the user a wide field of vision. It has a single filter and two voicemitters, one on the front of the mask for speaking directly into a telephone or radio handset and one at the side to allow personnel nearby to hear. A nose cup with two inlet valves fits over the nose and mouth. It directs incoming air across the inside of the lens to reduce fogging. The mask has a drinking tube that connects to a canteen with an M1 cap. The mask is not authorized for use during TIC spills, and the mask is not effective against chemicals such as ammonia, chlorine, or carbon monoxide fumes. The mask is not effective in confined spaces where oxygen levels are insufficient to sustain life.

M50 and M51 Masks

The JSGPM (TM-3-4240-542-13&P) is the first joint service protective mask designed to replace the M40/M42 series of masks, mask carrier, and accessories for the US Army and Marine Corps ground and combat vehicle operations and the MCU-2/P series of masks for the Air Force and Navy shore-based and shipboard applications. The JSGPM is provided in two models with individual stock numbers to support major operational modes: the M50 for field use and the M51 for use in combat vehicles.

The M50 and M51 face piece assemblies are built on a butyl and silicone rubber face blank with an inverted peripheral face seal and an integrated chin cup. The face piece assembly forms a comfortable seal on the wearer's face and protects the face, eyes, and respiratory tract from chemical and biological agents, designated TICs, and radiological particulates. The face piece assembly incorporates a flexible, single polyurethane eye lens that provides a widened and uninterrupted field of vision

compared to the M40 mask. A front module assembly provides a direct speech capability and integrates the exhalation disk valve, drinking system components, and communications interface. Filtration is provided by two filter mount assemblies (left and right) that integrate the air inlet disk valves and self-sealing disk valves, and a nose cup that controls the flow of air throughout the mask and prevents fogging of the eye lens during breathing.

Both masks use twin M61 filters, positioned on either side of the face piece, to provide protection against nuclear, biological, and chemical threats. The filters are attached to the filter mount using a twist and lock mechanism. The M51 uses the combat vehicle hose assembly to connect the mask to the vehicle collective protection system. Additionally, a protective hood is provided for JSLIST type VII users to protect the head and neck from exposure to agents because these suits lack a hood.

M53 Mask

The M53 mask (TM-3-4240-541-12&P) is specially designed to meet US Special Operations requirements; it is not a standard mask issued to other service members. The M53 face piece assembly is built on a butyl and silicone rubber face blank with an inverted peripheral face seal and an integrated chin cup. The face piece assembly forms a comfortable seal on the wearer's face and protects the face, eyes, and respiratory tract from chemical and biological agents, certain TICs, and radiological particulates. The face piece assembly incorporates a single, flexible, polyurethane eye lens; a variable resistance exhalation unit that allows for operations in negative pressure, powered air purifying respirator, self-contained breathing apparatus, and closed circuit breathing apparatus modes; drinking system components; a communications interface; and single filter mount assemblies with a 40-mm NATO thread that integrates the inlet disk valve and air deflector. The mask uses a single general purpose filter, positioned on the side of the face, to provide protection against nuclear, biological, and chemical threats and certain TICs. A particulate filter is also available as an additional authorization list item. A protective hood is provided for JSLIST type VII users.

Joint Service Lightweight Integrated Suit Technology

The JSLIST (TM-10-8415-220-10) consists of a two-piece garment system that provides protection from radiological, biological, toxins, and chemical contaminants. The JSLIST provides multiple improvements over legacy protective garments, including reduced thermal burden, reduced weight, and increased potential wear time. The garment is assembled with a rip-stop outer shell of 50% nylon and 50% cotton poplin, and an interior liner of filter fabric that uses carbon sphere beads to reduce chemical and biological contamination. The garment is manufactured in two distinct designs: type II and type VII. The type II has a hood and is used for most applications; the type VII has a stand-up collar and is used by Special Operations personnel. The JSLIST is currently available in desert camouflage, woodland, and universal camouflage.

The two JSLIST components are a coat and trousers. Each component is separately packaged in a factory sealed vacuum bag containing the ensemble item and a resealable bag. Once the garment has been removed from the vacuum-sealed packaging, it provides 45 days of wear and 120 days of service life. The JSLIST provides up to 24 hours of protection against chemical and biological agents in solid, liquid, or vapor form within the stated maximum wear time. The garment will also protect against alpha and beta radioactive particles. To properly maintain and store the JSLIST when not in use, the garment should be placed in the furnished resealable bag.

The JSLIST ensemble should be worn in all environments under threat of an imminent nuclear, biological, or chemical attack or after chemical operations have been initiated. The garment can be laundered up to six times by field methods; however, once the garment has been contaminated, the soldier must replace it as soon as mission permits by using mission-oriented protective posture (MOPP) gear exchange procedures.

The JSLIST adds weight to the soldier's workload. In addition, the garment reduces heat exchange with the environment and may add, depending on the level of exertion, 10°F to 15°F to the wearer's ambient temperature and heat burden. When wearing the JSLIST at MOPP 1 or MOPP 2 and complete encapsulation is

not required, certain modifications to the uniform are authorized:

- The trouser leg Velcro (Velcro Industries, Manchester, NH) closures may be opened.
- The waist tabs may be loosened.
- The jacket may be unzipped.
- The sleeve Velcro closures may be opened.

This overall loosening of the JSLIST will allow heat to escape because walking and other movements induce a bellows action of the suit against underlying clothing and skin.

Alternative Footwear Solution

The AFS is a chemical-biological protective overboot that is worn over normal combat footwear. It is issued with the JSLIST and available in sizes X-small to XX-large. The AFS will provide 24 hours of protection in a chemical or biological contaminated environment. The overboots can be worn for up to 376 hours over 45 days in an uncontaminated environment. AFS has an antislip ridge tread pattern for improved traction, an antistatic surface, and fully sealed and vulcanized seams, as well as three sets of buttons with a butyl rubber securing strap for each set. The adjustable securing strap is symmetrical and can be released from either side of the overboot. AFS overboots contaminated with petroleum, oil, and lubricants should be wiped off within 2 minutes and air-dried. If contaminants remain more than 2 minutes, the boot protection may be degraded. In such instances, the overboots must be replaced as soon as possible.

Joint Service Lightweight Integrated Suit Technology Block 2 Glove Upgrade

The JB2GU provides 24 hours of chemical and biological protection from battlefield concentrations of all known agents for up to 30 days of wear. The glove provides enhanced tactility, dexterity, durability, and comfort over legacy systems and can be worn in all climates. These qualities satisfy a broader spectrum of ground, shipboard, and aviation requirements. The JB2GU comes in two variants: flame-resistant (FR) and non-flame-resistant

(nFR). The FR variant combines a Nomex (DuPont, Wilmington, DE) and leather outer glove with an inner chemical protective liner for aviators and combat vehicle crews. The nFR variant is a molded glove made from compounded butyl rubber and comes with a removable protective liner for sweat management. The nFR glove is primarily for ground forces, and is available in sizes S to XL.

Individual Decontamination

The preceding section provided an overview of the primary US military IPE, which, when used correctly, will prevent contact with chemical agents in typical battlefield concentrations. The problem of decontamination arises when soldiers, because of poor training, poor discipline, or bad luck, become exposed to liquid agent despite the availability of protective masks and clothing.

This section addresses two decontamination kits currently in the US inventory: (1) the Joint Service Personnel/Skin Decontamination System (JSPDS), also known as Reactive Skin Decontamination Lotion (RSDL), and (2) the M295 Individual Equipment Decontamination Kit. Both kits are fairly simple in design and function, and instructions for their use are straightforward and easily committed to memory. Because of the potency of liquid nerve agents and the rapidly occurring tissue damage caused by vesicants, every soldier must be able to conduct an effective decontamination of all exposed skin without referring to the printed instructions.

Joint Service Personnel/Skin Decontamination System

The JSPDS, or RSDL (NSN-6505-01-507-5074; TM-3-6505-001-10), is an individually carried skin decontamination kit approved by the US Food and Drug Administration. RSDL provides the soldier with the ability to decontaminate the skin after exposure to chemical or biological warfare agents, in support of immediate and thorough personnel decontamination operations. The kit consists of decontaminants and applicators required to immediately reduce morbidity and mortality resulting from

chemical warfare agent contamination of the skin. The system's applicators are preimpregnated with RSDL, a potassium solution dissolved in a special solvent and water that facilitates the reaction of decontamination between the potassium salt and the chemical agent. The lotion decontaminates the warfare agents mustard (HD), soman (GD), and VX as well as T-2 mycotoxins on skin to a level that eliminates toxic effects better than the previous M291 kit. Each packet will decontaminate an area of 1,300 cm². The system can be used in temperatures ranging from -25°F (-32°C) to 130°F (54°C). In addition to immediate decontamination of the user's skin, it can be used to decontaminate individual equipment, weapons, and other casualties (on unbroken skin).

M295 Individual Equipment Decontamination Kit

The M295 (NSN-4230-01-357-8456; TM-3-4230-235-10) is a handheld kit used to apply decontaminant to the individual's personal equipment. Each kit consists of a carrying pouch, which contains four sealed packets, each with a wipe-down mitt containing 22 g of powder (enough to perform two complete individual equipment decontamination operations). Each packet is designed to fit comfortably within a pocket of the JSLIST overgarment trousers. The decontaminating powder in the mitt is contained within a pad material with a polyethylene film backing. In use, powder from the mitt is allowed to flow freely through the pad material. Decontamination is accomplished through sorption of contamination by both the pad and the decontaminating powder. The M295 is issued in boxes of 20. The kits should be stored at the squad level in a box capable of being decontaminated.

Detection and Alarms

This section will describe the equipment issued for detection and identification of chemical agent liquid and vapor in the environment. For both the individual soldier and the unit, the items of equipment listed below are the primary means of identifying the presence and type of chemicals on the battlefield and determining when a safe condition exists.

- M9 Chemical Agent Detector Paper
- M8 Chemical Agent Detector Paper
- M256A1 Chemical Agent Detector Kit
- Improved Chemical Agent Monitor (ICAM)
- M4A1 Joint Chemical Agent Detector (JCAD)
- M272 Chemical Agent Water Testing Kit
- M22 Automatic Chemical Agent Detector Alarm (ACADA)

M9 Chemical Agent Detector Paper

M9 paper (NSN-6665010498982; TM-3-6665-311-10) is placed on personnel and equipment to detect and identify the presence of liquid nerve or blister agents in exposures as small as 100 μm in diameter. The paper contains a chemical dye that turns pink, red, reddish brown, or red purple when exposed to liquid agents; however, it cannot identify specific agents. M9 paper is manufactured in 30-ft by 2-in adhesive-backed rolls of cream-colored paper. The rolls are packaged with a reusable plastic storage bag in a vacuum-sealed vapor barrier package. The detector paper dye may be a potential carcinogen; chemical protective gloves should be worn when handling M9 paper. Placement of M9 is dictated by the dominant hand of the user. If the user is right-handed, M9 paper should be placed around the right upper arm, left wrist, and right ankle. If the user is left-handed, M9 detector paper should be placed around the left upper arm, right wrist, and left ankle. If a color change is indicated, proper masking, decontamination, and MOPP procedures must be followed.

Although many substances are known to cause false positive responses on M9 paper (antifreeze, liquid insecticide, petroleum products), service members must mask and take other appropriate measures when detection is indicated. Attention to possible interfering substances on the battlefield can help in the later interpretation of a color change on the M9 paper in the absence of confirmation tests for agents.

M8 Chemical Agent Detector Paper

M8 paper (NSN-6665000508529) is used to detect the presence of liquid V-type nerve agents, G-type nerve agents, and H-type

blister agents. M8 paper is issued in booklets containing 25 tan-colored sheets of chemically treated dye-impregnated paper. The reverse side of the booklet's front cover contains a color comparison chart for agent recognition. If M8 paper is exposed to chemical agents, the dye-impregnated paper converts from tan to an agent-specific color. Colors corresponding to agents are as follows:

- G-type nonpersistent nerve agents: yellow
- H-type blister agents: red
- V-type persistent nerve agents: olive green or black

If indicated by M8 chemical agent detector paper or encountering a liquid suspected of being a chemical agent, service members must follow proper masking, decontamination, and MOPP procedures. To prepare M8 paper to conduct agent identification, tear one half-sheet from the booklet and affix it to a stick or other object. Using the stick as a handle, blot the paper onto the unknown liquid and wait 30 seconds. Once the 30 seconds has elapsed, compare the sheet to the color comparison chart.

As with M9 paper, M8 paper will show false positive indicators with substances such as antifreeze, liquid insecticide, or petroleum products. Attention to possible interfering substances on the battlefield can help in the later interpretation of a color change on the M8 paper.

M256A1 Chemical Agent Detector Kit

The M256A1 Chemical Agent Detector Kit (NSN-6665011334964; TM-3666530710), designed to detect and identify chemical agents in liquid or vapor, consists of the following:

- A booklet of M8 paper (previously described) to detect agents in liquid form, and
- 12 foil-wrapped detector tickets containing eel enzymes as reagents to detect very low concentrations of chemical vapors.

Table 9-1 lists the agents detected by the M256A1 kit. Instructions for the use of the detector tickets appear on the outside of each of the foil packets and in a separate instruction booklet. By

Table 9-1. Agents Detected by the M256A1 Chemical Agent Detector Kit

Agent	Symbol	Class
Hydrogen cyanide	AC	blood (cyanide)
Cyanogen chloride	CK	blood (cyanide)
Mustard	H	blister
Nitrogen mustard	HN	blister
Distilled mustard	HD	blister
Phosgene oxime	CX	blister
Lewisite	L	blister
Nerve agents	V and G series	nerve

following the directions on the foil packets or in the instruction booklet, service members can conduct a complete test with the liquid-sensitive M8 paper and the vapor-sensitive detector ticket in approximately 20 minutes. During the test, the sampler must be kept out of direct sunlight, which speeds evaporation of the reagents. Waving the detector sampler in the air also accelerates evaporation, so the sampler should be held stationary during all parts of the test.

Improved Chemical Agent Monitor

The ICAM (NSN-6665-01-357-8502; TM-36665343-10) detects agent vapor within a volume of air drawn by the pump into the sampling chamber of the instrument (Figure 9-1). It follows that the inlet port must not come into contact with a suspected area of evaporating agent on a surface but must nevertheless approach within a few inches of the site of suspected contamination. Because of variation in agent concentration from one spot to another, depending upon wind velocity and other environmental factors, numerical displays of agent concentration in typical units would be impractical and unreliable. Accordingly, the display warns of a low vapor hazard (1 to 3 bars visible), a high vapor hazard (4 to 6 bars visible), or a very high vapor hazard (7 to 8 bars visible).

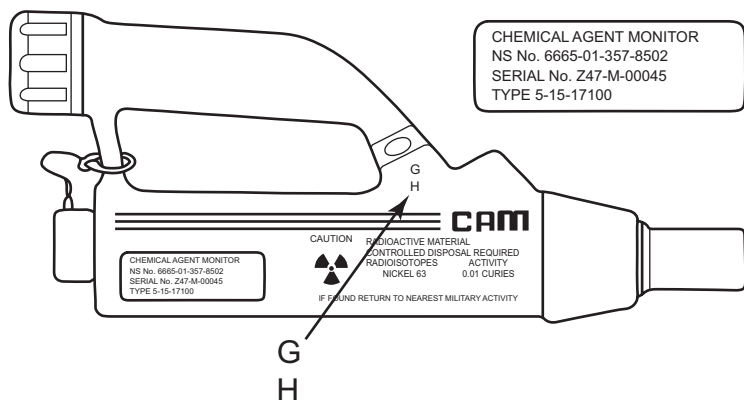


Figure 9-1. Improved Chemical Agent Monitor (ICAM). Used to detect nerve and blister agents as vapors only, the ICAM uses a 10-mCi nickel 63 β -particle radiation source to ionize airborne agent molecules that have been drawn into the unit by a pump. The resulting ion clusters vary in mass and charge and thus also travel at different rates in an applied electrical field. Comparison of the mobility of the different ionic species to electronically stored standards allows an on-board microcomputer to determine the type of agent and its relative concentration. A liquid crystal display presents these data as a series of concentration-dependent bars in a G mode for G agents and VX, and in an H mode for blister agents.

M4A1 Joint Chemical Agent Detector

The JCAD (NSN-6665-01-586-8286; TM 3-6665-456-10) is a hand-held device that automatically detects, identifies, and alerts operators to the presence of nerve and blister vapors, as well as one blood chemical agent vapor and one toxic industrial chemical vapor. The JCAD is modified from a commercially available device and operates as a stand-alone detector. It is capable of supporting the mission requirements of all four services, including:

- interior detection for both tracked and wheeled vehicles,
- fixed- and rotary-wing aircraft interior detection during both ground and airborne operations,
- shipboard interior and exterior detection,

- fixed-site chemical agent detection,
- personal detector to be carried on a individual soldier or used for advanced warning, and
- chemical agent surveys of personnel, equipment, and cargo.

The JCAD can also interface with the Joint Warning and Reporting Network. This interface allows the JCAD to be used as a networked fixed-site detector without direct operator contact. A hasty perimeter network (the Deployable Detector Unit Network function) may be employed through the use of M42 alarm units and WD-1 field wire. Up to ten JCADs may be “strung” together at distances up to 400 m apart. The base unit functions as a control unit to provide chemical alerts and malfunction signals for the other nine deployed units. The JCAD is carried by personnel and placed onto various platforms, including ground vehicles, fixed-site installations, and collective protection shelters.

The detector unit simultaneously detects nerve agents (sarin [GB], tabun [GA], GD, GF, and VX); blister agents (mustard [H], nitrogen mustard [HN3], and lewisite [L]); and blood agents (hydrogen cyanide [AC], cyanogen chloride [CK]). Operating the JCAD in enclosed or poorly ventilated spaces or when sampling near strong vapor sources of the following will sound a false alarm:

- aromatic vapors (eg, aftershave, perfume, food flavorings, peppermint);
- cleaning compounds (eg, disinfectant, menthol, methyl salicylate);
- smoke and fumes and gun oil;
- diesel exhaust, JP-8 (jet fuel) vapor;
- small arms lubricant;
- cigarette smoke; and
- paint fumes and chemical agent-resistant compound.

M22 Automatic Chemical Agent Alarm

The M22 ACADA (NSN-6665-01-438-6963; TM-3-6665-321-12&P) samples the air for the presence of nerve agent (GA, GB, GD) and blister agent (HD, L) vapors, and provides simultaneous detection and warning of these agents (Figure 9-2). It operates

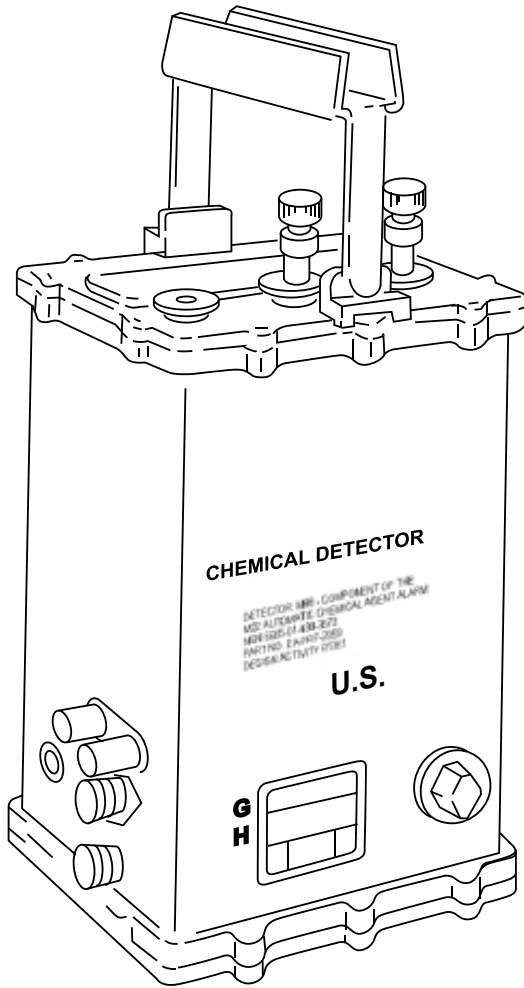


Figure 9-2. The M22 Automatic Chemical Agent Alarm (ACADA), which is capable of detecting and identifying standard blister and nerve agents. The system can be carried by a soldier, operates independently after system start-up, and provides an audible and visual alarm. It also provides communications interface for automatic battlefield warning. The system consists of the M88 detector, as many as five M42 alarm units, a confidence sample, protective caps, square inlet, rain caps, a carrying case, and various power supplies.

in cold and hot climates (- 30°F to 125°F). The following items can interfere with the normal operation of the M22 ACADA and will sound a false alarm:

- tear gas (CS),
- JP-8 jet fuel,
- brake fluid,
- aqueous fire-fighting foam, and
- M18 marking grenades (red and violet).

M272 Chemical Agent Water Testing Kit

The M272 kit (NSN-6665011340885; TM-3666531910) was designed and fielded to answer the need for a test to detect water contamination by nerve agents, blister agents, blood agents (cyanide), and lewisite. The kit will operate between 32°F and 125°F. An enclosed instruction card enables the soldier to conduct all the tests required to identify these threat agents. The kit will detect the chemical agents at the concentrations noted in Table 9-2.

Water containing agents in lesser concentrations than those listed in Table 9-2 is permissible for short-term use (up to 7 days) in both cold and warm regions, as long as the daily consumption per person does not exceed 5 quarts. Each kit contains enough reagents for tests on 25 separate water samples. The operator can easily conduct the full range of tests in 20 minutes when the

Table 9-2. Concentrations of Chemical Agents Detectable by the M272 Chemical Agent Water Testing Kit

Agent	Symbol	Concentration (mg/L)*
Cyanide	AC	20.0 as CN-
Mustard	HD	2.0
Lewisite	L	2.0 as As+++
Nerve agents	G, V	0.02

*Concentration reliably detected by kit tests. CN- is the liquid form of cyanide measurable in water.

As+++ is a form of arsenic, the positive elemental ion arsenous, which is measurable in water.

temperature is between 50°F and 105°F; at lower temperatures, the water samples and the nerve agent ticket should both be warmed for 10 minutes before beginning testing. Water that is too hot may cause foaming in the detector tubes for lewisite, mustard, and cyanide; therefore, water at temperatures between 105°F and 125°F should be cooled for at least 5 minutes to reduce its temperature to 105°F or cooler.

Patient Protective Equipment

This section discusses the following items:

- Patient Protective Wrap Kit
- Decontaminable Litter
- Resuscitation Device, Individual Chemical (RDIC)

Patient Protective Wrap Kit

Decontamination and medical treatment of chemical casualties often requires clothing removal and precludes dressing them in replacement JSLIST. The Patient Protective Wrap (PPW) Kit (NSN-6545-01-577-1047) was developed as an alternative form of protection. When used in conjunction with the consumable items listed below, the wrap protects uncontaminated patients from potential contamination during evacuation. The PPW protects the patient from exposure to harmful chemical and biological materials for up to 6 continuous hours. It consists of two components: the protective wrap and a motor blower assembly. Resembling a lightweight sleeping bag, the wrap is 107 cm wide by 249 cm long and weighs 2.7 kg. It is fabricated of a carbon-impregnated permeable top sheet and impermeable bottom sheet that is unaffected by all bodily fluids. The top sheet has an impermeable transparent window to permit observation of the patient. A protected entryway for inserting intravenous tubing is located at each side of the window. The blower is a small, lightweight unit providing a continuous flow of clean, filtered breathing air, which considerably reduces the danger of heat stress on the casualty, and increases the operational effectiveness of the wrap in hot climates.

NOTE: Patients should not be left in the wrap longer than 6 hours.

Decontaminable Litter

Contaminated casualties arriving at a medical treatment location will in most cases require decontamination prior to definitive treatment. The decontamination process requires the use of equipment organic to the treatment unit. Ideally, any equipment in limited supply should be capable of complete decontamination using field-available methods. The Decontaminable Litter (NSN 6530-01-290-9964) is made from a monofilament polypropylene that has high tensile strength and low elasticity. The fabric does not absorb liquid chemical agents and is not degraded by decontaminating solutions. It is flame retardant, highly rip resistant, and treated to withstand exposure to weather and sunlight. The fabric has a honeycomb weave, which results in a rough, non-slip surface, and liquids easily pass through the 40% of surface area that is open. The litter has carrying handles that retract into the metal pole frame for a closed total length of 83.5 in (212.1 cm) to allow the litter to be loaded onto the UH-60 helicopter. The handles have two open carrying positions: 90.0 in (228.1 cm) and 91.6 in (232.7 cm). The first position is a NATO standard; the second position allows increased gripping comfort. The aluminum poles were designed to provide direct gripping surfaces for litter stanchions. All metal parts are painted with chemical agent-resistant coating paint.

NOTE: Canvas litters exposed to liquid blister agents and then decontaminated still desorbed vapors for 72 hours.

Resuscitation Device, Individual Chemical

The Resuscitation Device, Individual Chemical (RDIC; NSN 6515-01-338-6602) is a ventilatory system consisting of a compressible butyl rubber bag, a NATO standard C2 canister filter, a non-rebreathing valve, a cricothyroid cannula adapter, and a flexible hose connected to an oropharyngeal mask. The mask is removable from the distal end of the flexible hose to allow the hose to be connected to the cannula adapter. The butyl rubber bag resists the penetration of liquid chemical agent that may be on the operator's chemical protective gloves, and is easily decontaminated. The elasticity of the outer cover limits

airway pressure to a maximal value of 70 cm H₂O. The device will deliver up to 600 mL of filtered air per cycle at a rate of 30 cycles per minute. The RDIC is used in a contaminated environment to ventilate casualties.