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Description of document: Army Foreign Science and Technology Center (FSTC) CW (Chemical Warfare) Materiel - North Vietnam, FSTC-CS-03-04-67, October 1967

Requested date: 28-February-2022

Release date: 19-May-2023

Posted date: 29-May-2023

Source of document: During COVID Pandemic conditions: [Email](#)

FOIA Request
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FORT MEADE, MD, 20755-5995
May 19, 2023

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Privacy Office

This is in reponse to your Freedom of Information Act (FOIA) request of February 28, 2022, and supplements our letter of March 8, 2022.

We have completed a mandatory declassification review of the INSCOM information in accordance with Executive Order (EO) 13526. As a result of our review, information has been sanitized that would result in an unwarranted invasion of the privacy rights of the individuals concerned. This information is exempt from the public disclosure provisions of the FOIA pursuant to Title 5 U.S. Code 552 (b)(3) and (b)(6). Exemption (b)(3) pertains to information that is exempt by statute. The applicable statute is 50 U.S.C. § 3024 (i), which protects intelligence sources and methods.

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Sincerely,

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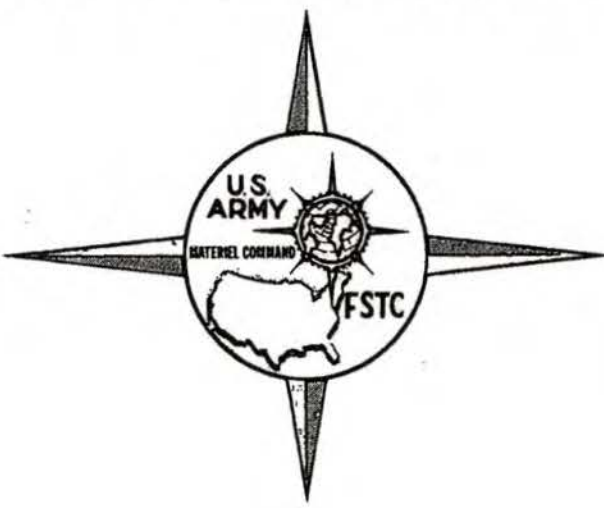
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ARMY MATERIEL COMMAND
U.S. ARMY
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CW MATERIEL--NORTH VIETNAM (U)

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(U) Product Identification: FSTC-CS-03-04-67

(U) Product Type: Trend Study

(U) Product Classification: SECRET/NO FOREIGN DISSEM EXCEPT U.K.,
CANADA, AUSTRALIA, AND NEW ZEALAND

(U) Product Title: CW Materiel--North Vietnam (U)

(U) Publication Date: October 1967

(U) Planned Revision: None

(U) FSTC Task No.: 7-503014

(U) b3

(U) Topic Tags: CW materiel, chemical agent, flamethrower, grenade, protective clothing, CW decontamination equipment, chemical warfare, detector kit, protective mask, decontamination kit, improvised CW materiel, CW research and development, CW trend, incendiary device.

(U)

~~(S/NFE)~~ Abstract: This study describes North Vietnam's current CW materiel capabilities for engaging in offensive and defensive chemical warfare, and provides a forecast of future capabilities. The study is based principally on intelligence information and on reports of exploited enemy equipment. The analysis is based on factual reports when possible, supplemented by explanations and considerations based on background knowledge of related aspects of intelligence. Based on this analysis, the following conclusions can be made: (1) North Vietnam is dependent on foreign sources for effective types of CW materiel; (2) North Vietnam's CW materiel capability is insignificant; and (3) this capability will remain inadequate in the foreseeable future.

(U) Pages: 63

(U) Tables: 0

(U) Illustrations: 25

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CW MATERIEL--NORTH VIETNAM (U)

October 1967

(Based on information available as of February 1967)

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PREFACE

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~~(S)~~ This study assesses the current and future importance of offensive and defensive chemical warfare (CW) materiel to North Vietnam's military potential. The assessment places special emphasis on sources of supply and quantities available. State-of-the-art and the effectiveness of individual models or types of equipment are also emphasized.

(U)

~~(S)~~ The study is of special significance because of the need to assess present and expected CW capabilities of the enemy opposing U. S. and Allied Forces engaged in combat in Vietnam. Because ground warfare is currently confined to South Vietnam, the geographical area of North Vietnam is treated separately, to some extent, from the combat areas of South Vietnam. North Vietnam may have stockpiles of CW materiel for use if that nation were invaded, or which might eventually appear in greater quantities in combat areas to the south. The lack of evidence to affirm such stockpiles is considered an outstanding gap in CW intelligence.

(U)

~~(S)~~ In this study, personnel believed to belong to formal North Vietnamese military units are referred to as the North Vietnamese Army (NVA); after infiltrating South Vietnam, these personnel may have become indistinguishable from their allied guerrillas, the Viet Cong (VC). Basic data have not always distinguished between the two elements.

(U)

~~(S)~~ North Vietnam's policies on the use of toxic CW agents are not known to have been formalized, or stated. Information has not been obtained from any individual alleged to have high-level or overall information on North Vietnam's CW materiel capabilities or military alliances which would provide CW materiel. Most of the information used in this study emanated from U. S. military sources in South Vietnam who obtained it from captured equipment and documents and by interrogation of prisoners and defectors, including "returnees."

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CW MATERIEL--NORTH VIETNAM (U)

SUMMARY

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~~(S)~~ North Vietnam lacks types and quantities of chemical warfare (CW) materiel with which to conduct offensive CW on a significant scale. Except for unknown quantities of flamethrowers, no holdings of standard types of offensive CW materiel have been confirmed. Improvised weapons, such as incendiary and tear agent grenades, are available in small quantities. Grenades of these types are used in South Vietnam, and white phosphorus artillery and mortar rounds and flamethrowers may be in use. None of these items is used extensively.

(U)

~~(S)~~ Although North Vietnam possesses several types of Soviet CW defensive equipment, large quantities are not known to be available. Domestically produced defensive materiel, which has been rather widely distributed among forces in the combat areas, includes improvised masks (which provide virtually no protection against CW agents) and several types of fairly effective personal decontamination kits.

(U)

~~(S)~~ Only standard types of Soviet equipment have been identified in North Vietnam, and the possibility exists that significant quantities of defensive CW equipment are held in North Vietnamese depots. Among this equipment are vehicular types used in CW reconnaissance, detection, and decontamination, but they have not been reported in the combat areas of South Vietnam. Small quantities of standard CW defensive equipment are provided combat elements in South Vietnam; these elements are numerically better equipped with improvised masks and domestically produced self-treatment kits.

(U)

~~(S/NFE)~~ North Vietnam lacks a capability to produce significant types and quantities of CW materiel. The nation is, and will remain, dependent on friendly foreign sources for CW materiel. Although these sources are capable of providing large quantities of offensive and defensive items, they probably will not provide North Vietnam with means of engaging in offensive CW to a significant extent.

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~~(S)~~ The conclusion can be made that North Vietnam's CW materiel capability is poor and will remain so.

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CW MATERIEL--NORTH VIETNAM (U)

(U)
Section I. ~~(S/NFE)~~ CURRENTLY AVAILABLE CW MATERIEL

(U)
A. ~~(S/NFE)~~ OFFENSIVE CW MATERIEL

(U)
1. ~~(S)~~ MATERIEL AVAILABLE IN NORTH VIETNAM

a. The North Vietnamese do not possess sufficient types or quantities of CW materiel to conduct offensive CW on a significant scale. Arsenals in North Vietnam are not known to contain stocks of chemicals commonly associated with CW (such as toxic, incendiary, and smoke screening agents) or the munitions or devices for disseminating these chemicals. Limited quantities of CW materiel items may be available, however, if only for training purposes or for use in defensive actions.

b. North Vietnam is known to have the Soviet Model LPO portable flame-thrower; although the total number is unknown, some chemical units are equipped with them. This outstanding model does not have a separate pressure tank, thereby greatly simplifying logistics; furthermore, the LPO has three identical fuel tanks which form an excellent low silhouette. The existence of other items of offensive CW materiel in North Vietnam has not been verified. Although some offensive CW materiel items have been established as being in use by NVA/VC forces operating in South Vietnam, their origins have not been traceable to North Vietnam.

(U)
2. ~~(C/NFE)~~ MATERIEL EMPLOYED IN SOUTH VIETNAM

a. Equipment Identification. Communist combat forces operating in South Vietnam have used tear agent grenades, phosphorus grenades, and flamethrowers to a limited extent; however, the NVA/VC forces are not currently equipped with types and quantities of materiel for conducting offensive CW operations on a significant scale. Because the offensive CW materiel used in South Vietnam usually lacks identifying characteristics, determination of country of origin is difficult, if not impossible.

b. Grenades.

(1) Because the Vietnamese are adept at improvising military devices in small factories or workshops, they are encouraged to capture U.S. CW materiel for use by NVA/VC guerrillas in improvised devices as well as in its original form. Several styles of CW grenades captured from Communist forces in South Vietnam may have been improvised.

(2) More than 1200 hand grenades filled with riot control agent CS (o-chlorobenzylmalononitrile) were captured, but conclusive evidence is lacking as to their origin. Laboratory analysis of the CS filling showed it to be identical with that

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used by the United States. Markings and other details suggest that the grenades may have been made by removing the original filling (possibly HE from an offensive-type grenade) and reloading with CS from captured U. S. munitions or bulk containers.

(3) A number of locally manufactured, bursting-type chemical hand grenades, which contained plasticized white phosphorus as the filler, were also captured. A spherically shaped, sodium-filled incendiary grenade (used for sabotage) and a cylindrically shaped grenade filled with white phosphorus and napalm may be improvised types of offensive weapons.

c. Flamethrowers.

(1) Flamethrowers and flamethrower fuel thickener are the only standard types of CW offensive materiel reported in use by NVA/VC forces in South Vietnam. At least six Soviet-type LPO-50 flamethrowers and small quantities of two types of fuel thickener have been captured in South Vietnam. Laboratory tests performed on these items (page 13 of the appendix) demonstrated that the LPO-50's performance depends largely on the chemical and physical characteristics of fuels used in it. In tests with fuel mixed with captured Soviet-type OP-2 thickener, the effective range was 20 to 80 yards and the center of deposit was 55 to 70 yards. In tests with a captured fuel mixture which contained natural-rubber thickener, the weapon performed unsatisfactorily; the fuel broke up in flight, and its effective range was 30 to 70 yards. The captured OP-2 thickener was composed of aluminum salts of naphthenic acids. This thickener makes an excellent gel with a minimum of stirring. The flamethrower must be thoroughly cleaned after use to prevent fuel breakdown. Even then, fuel mixture stored in the flamethrower will break down within 12 days, although it would remain in good condition if stored in the mixing barrel.

(2) Despite the known presence of flamethrowers in South Vietnam, only two or three reports of their use have been received; flamethrowers are not known to have been used in any specific engagement nor to have inflicted casualties.

(3) Intelligence on organization of chemical units and their authorized chemical equipment is incomplete; however, NVA chemical units are present in South Vietnam. "Light" and "heavy" flamethrower companies have been mentioned, but their compositions are unknown.

(4) No two-wheel, cartmounted flamethrowers (such as the Model TPO used by Soviet heavy flamethrower companies) have been detected in Vietnam. Although one VC source reported in use a flamethrower which has two fuel tanks, no model is definitely known to be employed except the LPO-50, which has three tanks. The Soviet Model ROKS-3 flamethrower, which has two tanks, is obsolete in the Soviet Army but may have been the two-tank flamethrower reported in Vietnam.

d. Other CW Materiel. Little evidence is available to indicate that NVA/VC forces have used flame and incendiary weapons in South Vietnam. Toxic chemical mines, grenades, and artillery rounds periodically reported in use by the VC are believed more likely to have been either smoke munitions or HE rounds which, because of incomplete combustion, generated noxious, gaseous-composition products with irritant effects particularly noticeable in enclosures or other areas where air movement might be restricted.

e. Conclusions.

(1) North Vietnam is inadequately equipped for offensive CW; greater emphasis is given defensive types of CW materiel.

(2) Any VC chemical agent capability is virtually nonexistent, and chemical operations are limited to the employment of irritant grenades and probably infrequent flamethrower attacks. The VC recently have used tear agent (CS) grenades and white phosphorus grenades.

(3) The following CW offensive items have been identified in South Vietnam:

Portable flamethrower, Model LPO-50
Sodium incendiary grenade (for sabotage)
Cylindrically shaped napalm/white phosphorus grenade
Tear agent CS hand grenade

Technical characteristics are listed in the appendix.

(U)
B. ~~(S)~~ DEFENSIVE CW MATERIEL

(U)
3. ~~(S)~~ MATERIEL AVAILABLE IN NORTH VIETNAM

a. Quantities and Identification.

(1) All CW defensive materiel positively identified in North Vietnam is of Soviet origin and includes truck-mounted decontamination equipment, manpack sprayers, personal decontamination kits, chemical agent detector kits, protective mask assemblies, and protective clothing. These Soviet items are generally considered good to excellent for their intended purposes. Domestically produced personal decontamination kits and improvised protective masks, similar to those captured in South Vietnam, are probably also available in North Vietnam; the locally produced kits contain useful components, but the improvised masks provide virtually no protection against CW agents. Total quantities of CW defensive items available to the North Vietnamese have not been reported or estimated. In all probability, any significant accumulation of CW items would be primarily intended for use in defense of North Vietnam, rather than for use outside the national boundaries. This distinction might apply especially to the truck-mounted

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decontamination equipment, which is better suited for use in populated areas and on developed road systems than in the streams, paddies, and jungles and on the mountainous terrain of South Vietnam.

(2) The small quantities of CW defensive materiel that have been captured in South Vietnam may indicate that stocks in North Vietnam are relatively small. A possibly valid, but unconfirmed, report provides limited information on quantities of CW defensive materiel in North Vietnam. According to this report, a "chemical defense battalion" is located in each North Vietnamese military district and is equipped with the following: about 40 vehicles (including CBR reconnaissance, decontamination, and laboratory vehicles); 15 manpack decontamination spray devices; 4 anemometers; and 1 set of individual protective equipment (protective cape, protective suit, protective mask, and canister) for each man. Based on this report the following equipment is probably authorized and issued to chemical units:

- Detection kit, Model PKhR-54 (or variation thereof)
- Protective mask, Model ShM-1
- Canister, Model MO-4U
- Lightweight protective suit, Model L-1
- Decontamination apparatus, manpack, Model RDP-4
- Decontamination kit for personal weapons, Model ?
- Decontamination apparatus, truck-mounted, Model ARS-12U
- Decontamination apparatus, truck-mounted, Model DDA-53
- Decontamination apparatus, truck-mounted, Model ADM-48D

b. Characteristics. The principal characteristics of significant defensive CW materiel items are outlined in the following paragraphs. Detailed technical characteristics of the Soviet types of equipment and of domestically produced decontamination kits and protective masks are presented in the appendix.

(1) Detection devices. The PKhR-54 detector kit contains a hand-operated pump used to pull air through glass indicator tubes that react with toxic agents in the air to give characteristic color changes. Standard U.S. toxic chemical agents, including sarin (GB) but probably not VX, are detectable with this kit. Although no automatic alarms for toxic chemical agents have been specifically reported, the Soviet CBR reconnaissance vehicles mentioned above are usually equipped with the Model GSP-1 automatic alarms, which are believed capable of detecting the nerve agent sarin and activating both audible and visual alarms. The GSP-1 also detects beta/gamma radiation and activates the same alarms. In any event, crews of these CBR reconnaissance vehicles would at least have the PKhR-54 detector kits.

(2) Protective masks. The most significant item of defensive equipment listed above is the Soviet protective mask Model ShM-1, which, with the MO-4U canister and connecting hose, constitutes the latest known Soviet mask assembly for general issue. The hood-type facepiece completely covers the head, forms a tight peripheral seal, and has a double outlet valve which prevents backleakage

into the facepiece. Used with the MO-4U canister, the ShM-1 offers excellent protection against all known standard toxic chemical agents (including nerve agents) and against most probable BW agents in either the vapor or aerosol state. The ShM-1 mask, however, would be extremely uncomfortable to wear under normal Vietnamese climatic conditions.

(3) Protective clothing. The lightweight protective suit Model L-1 would provide excellent overall body protection against percutaneously effective toxic agents. Stocks of these suits are probably limited, however, even for distribution to chemical personnel. General-issue items for overall body protection against liquid toxic chemicals are believed to be virtually nonexistent.

(4) Self-aid and first aid kits. Various directives mention the use of atropine syrettes for treatment of nerve agent casualties and amyl nitrite inhalants for treatment of casualties from hydrogen cyanide, but no information has been received on the actual issue of these items. Some locally made individual decontamination kits are provided with soap and antiseptics to prevent and treat infections; the kits also contain solutions to minimize the burn effects from white phosphorus.

(5) Collective protection equipment. No collective protectors either for field shelters or for use on armored vehicles are believed to be available.

(6) Decontamination equipment. Decontamination equipment ranges from the crude, locally manufactured individual decontamination kits, which could be partially effective, to the Soviet manpack and truck-mounted devices described in detail in the appendix. Although the Soviet items are probably few in number, the individual items have excellent capabilities for the decontamination of both nerve and blister agents from personnel, clothing, small arms and other personal equipment, weapons, vehicles (including armored vehicles), and terrain. One outstanding example of such items is the DDA-53 truck-mounted apparatus, capable of supplying steam for decontamination of clothing in the chambers mounted on the truck bed, and simultaneously furnishing hot water for the decontamination of personnel.

(7) Other CW materiel. A few additional allegedly Soviet items reported in North Vietnam lack sufficient descriptions for identification by model numbers:

(a) A "chemical laboratory truck," equipped for use in testing to identify CW and RW contaminants.

(b) "Antiatomic radiation suit No. 1," described as a protective cape made of thick cellophane. It may be comparable to commonly used, disposable capes carried in protective mask carriers.

(c) A "laundry truck," a 10-wheel truck equipped with a crane hoist and a steel tank, 1 meter in diameter x 1.3 meters high (possibly the Soviet

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decontamination boiling installation BU-2). In use the tank is lowered to the ground, filled with water, and heated, and contaminated clothing is washed in it.

(d) "Anemometers"--equipped with air speed and direction indicators, a compass, and a thermometer--provided among CBR reconnaissance equipment.

(U)

4. ~~(S)~~ MATERIEL EMPLOYED IN SOUTH VIETNAM

Some major differences are apparent between the types of CW defensive equipment used by NVA/VC forces in South Vietnam and the types available in North Vietnam.

a. Standard Equipment.

(1) Only standardized CW materiel items have been identified in North Vietnam; a few standard items have been captured in South Vietnam, but non-standard or improvised items are predominant. Evidence has not indicated that standardized items are available in significant quantities to the Communist elements. Only a small percentage of these elements are believed to be equipped with effective masks or other sophisticated protective equipment.

(2) Although truck-mounted CW equipment is available in North Vietnam, none has been reported in the combat areas of South Vietnam. Aside from the possibility that this equipment may be in short supply, several additional reasons might help to explain its absence in the south: logistical problems related to poor roads and difficult terrain characteristics; the characteristic guerrilla tactics generally employed; and lack of a serious belief in a toxic agent threat.

(3) Small quantities of the following Soviet-type items have been captured in South Vietnam:

Detection kit, Model PKhR-54
Protective mask, Model ShM-1
Canister, Model MO-4U
Lightweight rubberized coverall with integral hood and boots
Glove, protective, rubberized fabric, two-fingered
Decontamination kit, individual, Model IPP
Decontamination kit for personal weapons

Detailed technical characteristics of these items are provided in the appendix.

b. Improvised Items and Methods.

(1) Considerable emphasis is placed on locally produced, improvised self-treatment kits and protective masks, as well as on training and on literature which provide elementary education in the use of this equipment. Certain components of the self-treatment kits are known to be useful against CW contaminants; other components are too primitive to be judged. Readily available substances, such as

lime and urine, are among those recommended by NVA/VC for decontamination. Cloth and plastic sheeting are used in improvised protective masks, of which several types may be available. Although these masks provide virtually no protection, they are strongly advocated in training and doctrine for use against herbicides, defoliants, and tear agents (all lethal according to NVA/VC doctrine) as well as more toxic agents. The training and the availability of these masks may have the following psychological effects, the net value of which cannot be estimated: (1) Users may have acquired enough confidence in the masks to prevent fear of fighting in a CW-contaminated environment, (2) reliance on the use of the improvised masks in contaminated areas could lead to disastrous results, (3) more knowledgeable users may be unwilling to fight in a suspected CW environment, and (4) the training and literature may have intensified resentment against U.S. employment of chemical agents.

(2) The following items of improvised CW defensive equipment are used by NVA/VC forces operating in South Vietnam:

- Self-treatment kit containing seven packets
- Self-treatment kit containing five packets
- Decontamination kit (with antismoke mixture)
- Protective masks (improvised types)

Technical characteristics of these items are provided in the appendix.

(U)
Section II. ~~(S/NFE)~~ CW MATERIEL RESOURCES

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A. ~~(S)~~ DOMESTIC RESOURCES

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5. ~~(S)~~ RESEARCH AND DEVELOPMENT IN NORTH VIETNAM

North Vietnam is not believed to be engaged in research and development programs on offensive types of CW materiel. A few simple, locally fabricated items which have been captured in South Vietnam reflect lack of sophisticated features. No evidence is available to indicate the presence of any CW research facilities or the employment of scientists engaged solely in CW research and development. North Vietnam will probably not attain a sufficient background in science and technology to support and promote CW research in the foreseeable future.

(U)
6. ~~(S)~~ ECONOMIC LIMITATIONS

CW materiel production in North Vietnam is limited, in part, by the inability to produce complex machinery and equipment. An additional problem is the lack of large manufacturers of chemicals, petrochemicals, insecticides, and pharmaceuticals--all of which are indicators of CW agent production capabilities. Of the 18.1-million population in North Vietnam, less than 10% are employed in industry. The nation's ability to provide CW materiel is therefore limited by its

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scientific/industrial structure. Another important limitation is imposed by the lack of national wealth; in 1965, the gross national product was estimated to be only \$1.7 billion, or \$94 per capita (U.S. dollars). These industrial and economic limitations preclude the likelihood of the development of a significant CW capability in North Vietnam without strong assistance from foreign sources.

(U)

7. ~~(C)~~ PRODUCTION

a. North Vietnam is not known to have any significant physical facility or organized means of manufacturing CW materiel or of producing standardized items. The probability must not be overlooked, however, that small, scattered plants in North Vietnam are turning out rudimentary items. The Vietnamese have demonstrated the aptitude for improvising devices by using whatever is available. In addition, throughout more than a decade of local warfare, the Vietnamese have gained experience and have had ample opportunities to examine captured and abandoned French and U.S. CW equipment.

b. During the current involvement of U.S. Forces in Vietnam, several locally produced items of CW materiel have been captured from NVA/VC forces. Of the offensive-type weapons captured, none is believed to have been produced in North Vietnam; the weapons were probably made in small workshops in South Vietnam. Captured items have included a mortar round filled with red pepper, a sodium incendiary (sabotage) grenade, grenades filled with napalm/white phosphorus (WP) mixture, a type of grenade filled with WP alone, and another filled with tear agent CS (believed captured from the U.S. Army). Defensive items have also been captured and have consisted of various types of crude protective masks and decontamination packets for individual use. Origin of the improvised masks is not known, but their production would not require factory equipment. The decontamination packets, however, with features indicating more sophisticated packaging techniques, may be products of North Vietnam.

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B. ~~(S/NFE)~~ FOREIGN RESOURCES

(U)

8. ~~(S/NFE)~~ OFFENSIVE MATERIEL

a. North Vietnam appears to be almost totally dependent on foreign sources for offensive CW materiel. Modern items, in all broad categories of CW materiel, are available in some other Communist countries in sufficient quantities to support large-scale uses in Vietnam. Current evidence indicates, however, that none of these countries is providing the comprehensive outlay of equipment that would be required to wage offensive CW; in fact, except for a few flamethrowers, no offensive equipment of foreign origin has been identified. Although the Communist countries are capable of supplying North Vietnam with toxic agents, dissemination systems, and other materiel in quantities that would support significant offensive uses, it appears highly improbable that they will do so. A rational decision would be expected to include considerations of the following problems:

- (1) Antagonistic world opinions regarding offensive CW.
- (2) U.S. capabilities to retaliate with, and defend against, CW agents.
- (3) Logistical problems in supplying North Vietnam with toxic agents and means of handling, storing, and disseminating them, and with special protective equipment that would be required.
- (4) Training North Vietnamese personnel adequately in offensive and defensive CW.
- (5) Ascertaining the feasibility of engaging in all-out chemical warfare with respect to local conditions of climate, vegetation, topography, and human population.
- (6) Weighing the anticipated gains against the overall effort and risk.

These formidable problems should discourage a foreign source from providing North Vietnam with an offensive CW capability. Otherwise, Communist China or the Soviet Union could provide effective defensive materiel and CW agents ranging from World War I types to the highly lethal nerve agents.

b. Communist China is credited with capabilities to produce the lung irritant phosgene (CG); the blister agents mustard (H) and lewisite (L); the systemic poison hydrogen cyanide (AC); the harassing agents diphenylchlorarsine (DA) and adamsite (DM); the tear agent chloroacetophenone (CN); and, probably, the nerve agent sarin (GB). The U. S. S. R. is capable of producing all these and, in addition, the nerve agent soman (GD) and a V-type agent.

(U)

9. ~~(C)~~ DEFENSIVE MATERIEL

North Vietnam employs several items of standard Soviet CW defensive materiel (see par. 3 and the appendix). No evidence is available to indicate that the Soviet Union has supplied large quantities of any of these items, and, based on numbers of items captured in South Vietnam, total quantities are probably small. Communist China has supplied protective masks, but information as to quantities and types is not available. Medical and pharmaceutical supplies which originated in other countries have probably contained compounds which would be useful in treating CW injuries. Small quantities of atropine (a nerve agent antidote) have been identified among equipment captured from the VC. The captured atropine appeared to be supplied for medical uses not related to CW therapy.

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(U)
Section III. ~~(S)~~ TRENDS

(U)
10. ~~(S)~~ RECENT TRENDS

The North Vietnamese have acquired an awareness of the dangers of modern CW agents and offensive weapons but have provided extremely limited means of protection against them. Also to a limited extent, Communist China and the U. S. S. R. have provided training and modern types of offensive and defensive materiel; the training methods and types of materiel are basically of Soviet origin. In addition to this foreign assistance, the North Vietnamese have improvised training methods and materiel which are crude by modern standards but which may represent maximum native capabilities. Under existing pressures and strains of war, North Vietnam's domestic capabilities for developing and producing CW materiel cannot be expected to improve significantly.

(U)
11. ~~(S)~~ FUTURE TRENDS

In all probability, foreign sources have not supplied, nor will supply, toxic agents or defensive CW materiel in sufficient quantities to support large-scale offensive or defensive CW. The conclusion can be made, therefore, that North Vietnam lacks significant CW materiel capabilities and will not develop them. The NVA/VC will, however, continue to introduce nonstandard types of CW materiel on a small scale.

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APPENDIX (C)

TECHNICAL CHARACTERISTICS OF CW EQUIPMENT AVAILABLE TO NVA/VC FORCES (U)

A. CW MATERIEL IDENTIFIED IN NORTH VIETNAM (U)

	<u>Page</u>
Flamethrower, Model LPO-50	13
Suit, Protective, Lightweight, Model L-1*	15
Decontamination Apparatus, Manpack, Model RDP-4*	17
Decontamination Boiling Installation, Truck-Mounted, Model BU-2	19
Decontamination Apparatus, Truck Mounted, Model ARS-12U*	21
Decontamination Apparatus, Truck-Mounted, Model DDA-53*	23
Decontamination Apparatus, Truck-Mounted, Model ADM-48D*	25

B. STANDARD COMMUNIST CW ITEMS SUPPLIED TO NVA/VIET CONG FORCES IN SOUTH VIETNAM (U)

Flamethrower, Model LPO-50	13
Flamethrower, Portable, Model ROKS-3**	27
Detection Kit, Model PKhR-54	29
Mask, Protective, Model ShM-1	31
Canister, Model MO-4U	33
Coveralls, Rubberized, Lightweight, With Integral Hood and Boots, Model ?	37
Glove, Protective, Rubberized Fabric, Two-fingered, Model ?	39
Decontamination Kit, Individual, Model IPP	41
Decontamination Kit for Personal Weapons, Model ?	43

C. LOCALLY PRODUCED CW ITEMS PRESENT IN SOUTH VIETNAM (U)

Grenade, Hand, Tear Agent CS, Model T-766B ?	45
Grenade, Napalm	47
Grenade, White Phosphorus	49
Grenade, White Phosphorus and Napalm	51
Sodium Incendiary Device	53
Decontamination Kit (with Antismoke Mixture)	55
Self-Treatment Kit Containing Seven Packets	57
Self-Treatment Kit Containing Five Packets	61
Protective Masks (Improvised Types)	63

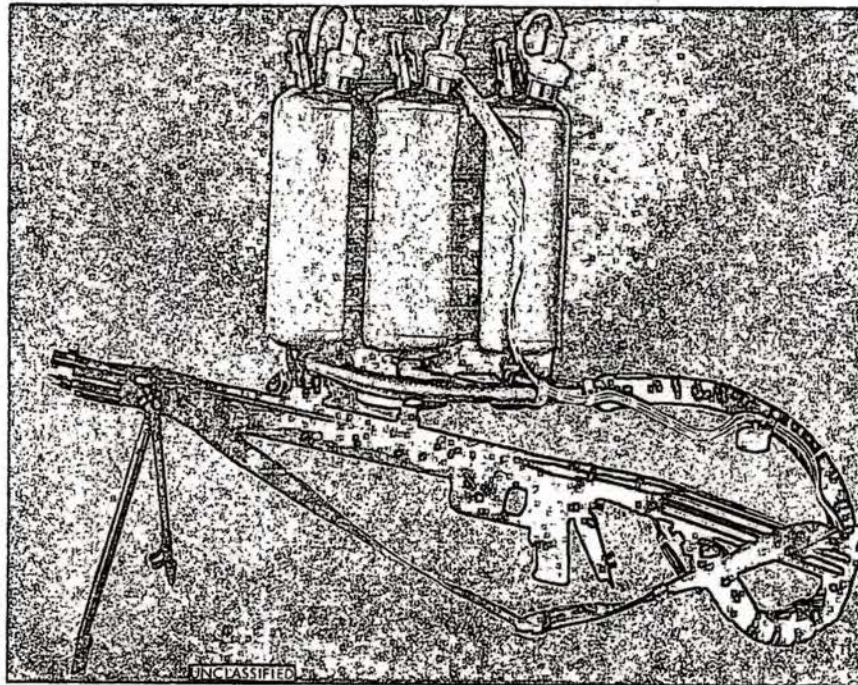
* Presence probable but unconfirmed.

** Presence unconfirmed. (See Par. 2c, p. 2.)

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FSTC-CS-03-04-67

NOMENCLATURE: Flamethrower, Model LPO-50 (North Vietnamese designations L-5 Gun and AT-64 Rifle)



(U)

~~(C/NFE)~~ The LPO-50 is believed to be the most recent model Soviet-developed portable flamethrower. The LPO-50 comprises a back-packed tank group with three fuel tanks, a tank group manifold leading to a hose which connects the tanks with a flame gun assembly, and a flame gun with bipod. The weapon's trigger fires each tank individually and selectively by means of an electrical system. Electricity, provided by dry batteries located in the gun, is used to fire a pyrotechnic pressurizing charge at the top of each fuel tank and an ignition charge at the gun muzzle to discharge each tankful of flame fuel. Pressure generated by the pressurizing cartridge forces the fuel through the hose to the gun. The fuel is ignited by the other charge at the muzzle. Three ignition cartridges, one for each tank of fuel, are inserted in chambers at the muzzle when the weapon is being prepared for firing. The larger fitting which protrudes from the top of each fuel tank serves as the filler plug and as the holder for the pressurizing pyrotechnic cartridge. The smaller fitting which also protrudes from the top of each tank is a pressure-relief valve. A one-way check valve, located in the bottom of each tank, prevents fuel and pressure from blowing back into either of the other two tanks.

(U) According to Soviet specifications, the effective range of fire is 40 to 50 meters (45 to 55 yards); the maximum high trajectory range is 70 meters (75 yards); all three tanks can be fired in 5 to 7 seconds, and the flame fuel is composed of gasoline and a Soviet-type OP-2 thickening agent. The operating instructions state that the flamethrower's performance will be influenced by the properties of the fuel mixture, especially the viscosity of the mixture and the ambient temperature at time of use.

(U)

~~(C)~~ The U.S. has exploited LPO-50's (believed to be products of Communist China) and two types of flamethrower fuel, all of which were captured in Vietnam in 1966.* In field tests, performance

* U.S. Army FSTC Exploitation Report; Flamethrower, Portable (Copy of Soviet LPO-50, and Components); FSTC 5352-158-65, July 1966, ~~CONFIDENTIAL/NOT RELEASABLE TO FOREIGN NATIONALS~~

NOMENCLATURE: Flamethrower, Model LPO-50 (North Vietnamese designations L-5 Gun and AT-64 Rifle)

varied with quantities and types of thickeners used and with the characteristics of the gels that were formed. The optimum mix with captured OP-2 thickener (aluminum salts of naphthenic acids) was 4%, with fuel breakup in flight and incomplete fuel ignition. The effective range was 20 to 80 yards, and the center of deposit 55 to 70 yards. Another type of captured flamethrower fuel contained natural rubber and performed unsatisfactorily; it broke up in flight, and its effective range was 30 to 70 yards. The LPO-50 was also tested with the U.S. Type M-4 thickener which, when 2.0 to 2.5% was used, had an effective range of 40 to 75 yards and a 50- to 60-yard center of deposit. In these tests it was concluded the fuel breakup in flight may have been caused by the LPO-50's high operating pressure when used in conjunction with the nozzle opening of 5/8 inch.

(U)
(C) The physical characteristics of the LPO-50 are as follows:

b3

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FSTC-CS-03-04-67

NOMENCLATURE: Suit, Protective, Lightweight, Model L-1 (U)

NATIVE DESIGNATION: ПЕГКИЙ ЗАЩИТНЫЙ КОСТЮМ, Л-1

ITEM: FOM-2-8415-4-3

COUNTRY: U.S.S.R.*

ADOPTED: 1955 or earlier



(U)

(C) The Model L-1 lightweight protective suit is made of rubber-coated cotton fabric for use by CBR reconnaissance units. It comprises a hooded blouse (FOM-2-8415-2-2 or a comparable one), trouser with integral rubber-soled buskins (FOM-2-8415-3-1), a hood liner, one or two pairs of gloves (FOM-2-8415-6-1), and a carrying case for the ensemble. Tight closures are provided at the waist and at face, head, sleeve, and leg openings to prevent entry of body-contaminating spray or aerosols. A protective mask is normally used with the suit to protect the face and the respiratory system in contaminated areas.

(U)

(C) The Model L-1 protective suit affords good body protection against BW and CW agents and against particles that emit alpha and beta radiation.

* Probably available in North Vietnam.

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FOM-2-8415-4-3

FSTC-CS-03-04-67

NOMENCLATURE: Suit, Protective, Lightweight, Model L-1 (U)
(C) (U)

1 <u>CURRENT STATUS:</u> ----- Standard	3 <u>PERFORMANCE:</u>
2 <u>PHYSICAL DATA:</u>	a Liquid agent penetration --- Good resistance
a <u>Material</u> ----- Cotton cloth with rubber coating on one side	b Effects of cold ----- Remains flexible
b Color ----- Brown green ?	c Tensile strength ----- Good
c Weight ----- 6.6 lb ?	d Tear resistance ----- Good
d Size ----- Three	e Breaking strength ----- Good

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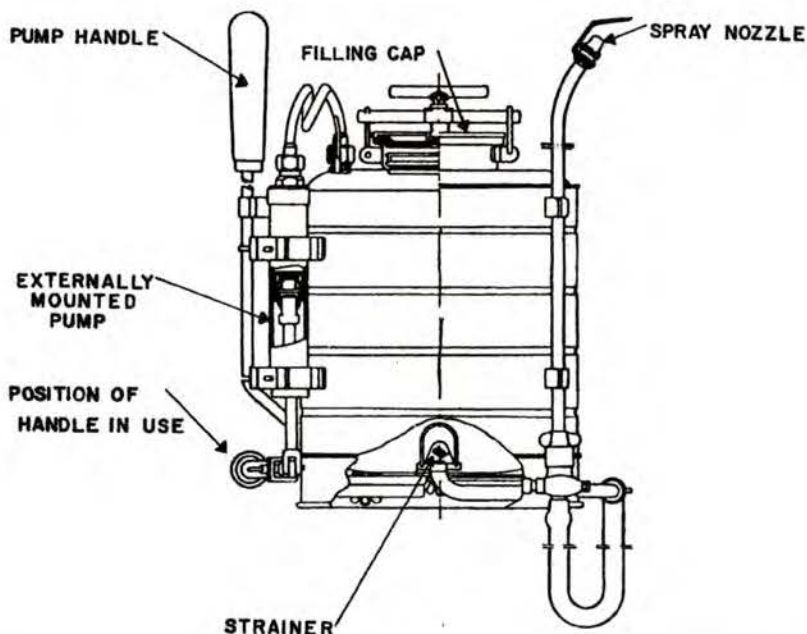
ITEM: FOM-2-4230-2-2

NOMENCLATURE: Decontamination Apparatus, Manpack, Model RDP-4

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: РАИЦЕВЫЙ ДЕГАЗАЦИОННЫЙ ПРИБОР РДП-4

ADOPTED: 1948



The Model RDP-4 decontamination apparatus, designed primarily for backpack operation, features an externally mounted hand pump that eliminates the problems arising from the location of the pump in the Model RDP-3 spray apparatus (FOM-2-4230-2-1). Other components of the RDP-4 are: (1) A tank, which has a large filling aperture fitted with a screwdown lid and a filter screen; (2) a flexible hose through which the pump delivers air to the tank; (3) a screen over the outlet point to reduce the danger of clogging in the discharge line and nozzle; (4) a cutoff valve on the discharge line; and (5) a circular scrubbing brush that may be fitted to the nozzle.

The decontaminants prescribed for use in the RDP-4 are dichloramine-B or -T in dichloroethane, and bleach slurry, which is corrosive to metal and therefore requires thorough cleaning of the components immediately after the decontamination procedure is carried out.

The Model RDP-4 is replacing the RDP-3 and is standard equipment on certain truck-mounted decontamination apparatus. The ADM-48D (FOM-2-4230-3-3) is fitted with six; the ADM-750, as well as the ARS-12U (FOM-2-4230-3-1), carries four to six for remote operations.

*Probably available in North Vietnam.

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NOMENCLATURE: Decontamination Apparatus, Manpack, Model RDP-4

1 <u>CURRENT STATUS:</u> ----- Standard	4 <u>DECONTAMINANTS:</u> ----- See remarks
2 <u>MAJOR COMPONENTS:</u>	5 <u>PERFORMANCE:</u>
a Tank ----- Metal	a Coverage ----- ? (see remarks)
b Pump ----- Metal	b Discharge rate ----- 0.7 to 0.85 qt per min at 25 to 30 strokes per min
c Hose ----- Rubber	c Operating pressure ----- ?
d Straps ----- Webbing	
3 <u>PHYSICAL DATA:</u>	
a Capacity-maximum ----- 3 gal	
-working ----- 2.2 gal ?	
b Weight-filled ----- 44 lb	
-empty ----- 18 lb	
c Dimensions-length ----- 14 in ?	
-width ----- 7 in ?	
-height ----- 24 in ?	

REMARKS:

Item 4. CW agents
Mustard and lewisite
(on wood and metal)

Decontaminants
Dichloramine-B or -T
in dichloroethane

Mustard and nerve agents
(on terrain and vehicles)

Bleach slurry

Item 5a. The Soviets claim that one filling will decontaminate 40 rifles, or 40 light machineguns, or 15 heavy machineguns, or 2 cannons, or 1 armored tank.

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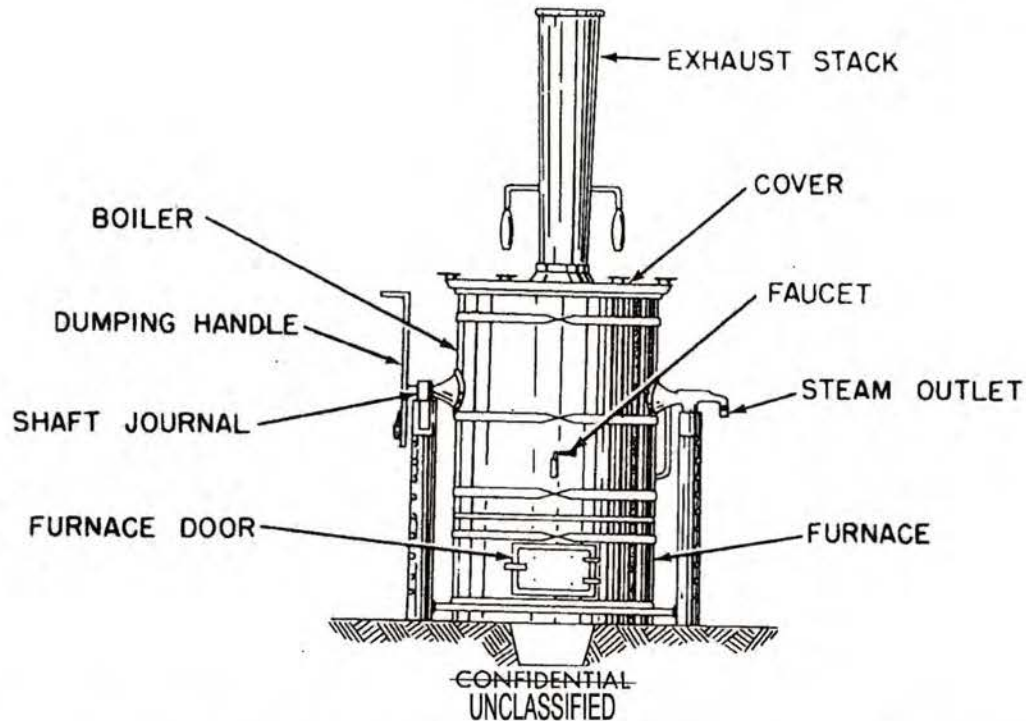
ITEM: FOM-2-4230-3-9

NOMENCLATURE: Decontamination Boiling Installation, Truck-Mounted, Model BU-2(U)

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: БУЧИПАВНАЯ УСТАНОВКА БУ-2

PRODUCED: 1940 ?



(U)

~~(C)~~ The Model BU-2 apparatus is used to decontaminate clothing by boiling. Comprised of two tilt-able kiers, each equipped with a furnace, and a reserve tank, this truck-mounted unit can be operable in about 30 minutes. (The crew can fill each kier with water in 6 minutes, and the reserve tank in 15 minutes.) The furnaces are capable of heating water from 50° F. to 212° F. in 50 to 60 minutes by using solid fuel, and in 40 to 50 minutes with internally mounted steam coils.

(U)

~~(C)~~ Except for having only one kier, the BU-3 (FOM-2-4230-3-10) is identical with the BU-2.

* Probably available in North Vietnam.

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FOM-2-4230-3-9

FSTC-CS-03-04-67

NOMENCLATURE: Decontamination Boiling Installation, Truck-Mounted, Model BU-2(U)

<p>1 <u>CURRENT STATUS</u>: ----- May be obsolete</p> <p>2 <u>MAJOR COMPONENTS</u>: --- 2 tiltable boiling kiers with separate furnaces</p> <p>3 <u>CARGO TANKS</u>:</p> <p>a <u>Capacity-maximum</u> ---- Each kier, 92.5 gal; reserve tank 185 gal -working ----- Does not apply</p> <p>b <u>Weight-filled</u> ----- ? -empty ----- ?</p> <p>c <u>Dimensions-length</u> --- ? -width ----- ? -height ----- ?</p> <p>4 <u>PUMPS</u>:</p> <p>a <u>Power-driven</u> ----- Does not apply</p> <p>b <u>Hand-operated</u> ----- Piston-type water pump</p>	<p style="text-align: center;">(C) (U)</p> <p>5 <u>PLUMBING SYSTEM</u>: ----- Does not apply</p> <p>6 <u>DECONTAMINANT</u>: ----- 2% soda in water</p> <p>7 <u>PERFORMANCE</u>:</p> <p>a <u>Coverage</u> ----- See remarks</p> <p>b <u>Discharge time</u> ----- Does not apply</p> <p>c <u>Discharge rate</u> ----- Does not apply</p> <p>d <u>Operating pressure</u> ----- Does not apply</p> <p>8 <u>GENERAL DATA</u>:</p> <p>a <u>Carrier-type</u> ----- ZIL-5 -capacity ----- 2-1/2 ton</p> <p>b <u>Crew</u> ----- 6</p> <p>c <u>Miscellaneous equipment</u> --- See remarks</p>
--	--

REMARKS:

Item 7a.	Item	Max decontami- nation by both units in 24 hr	Capacity of each kier	Boiling time (hr)
	Underwear	1300 sets	50 sets	0.5 (linen or cotton)
	Cotton uniforms	1000 sets	40 sets	0.5 (linen or cotton)
	Rubber boots	60 pairs	30 pairs	1
	Rubber gloves	6000 pairs	300 pairs	1

Item 8c. Hand pump, hand wringer, field drying-equipment, wheelbarrows, shovels.

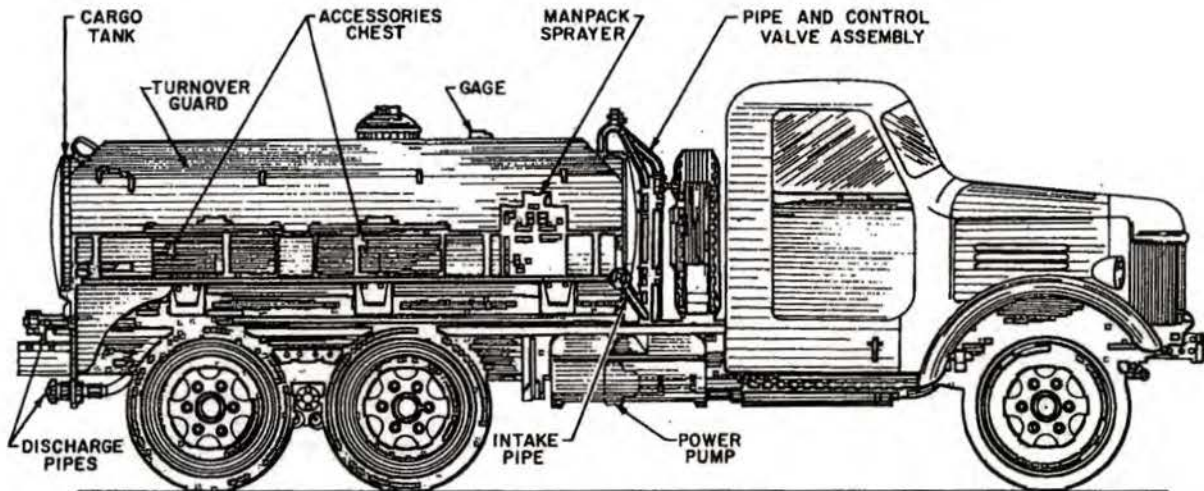
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NOMENCLATURE: Decontamination Apparatus, Truck-Mounted, Model ARS-12U

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: АВТОМОБИЛЬ РАЗБРЫЗГИВАТЕЛЬНОЙ СИСТЕМЫ, АРС-12У

ADOPTED: Prior to 1962



The versatile Model ARS-12U CW decontamination apparatus, installed on a ZIL-157 chassis, can be driven to a contaminated object or established at a decontamination point to which such objects are brought; it is capable of transporting water and pumping it directly to shower heads; and it can serve as a water-reservoir or water-supply vehicle for other decontamination equipment that furnishes hot water or steam to shower units, laundry facilities, and steam chambers. Ancillary equipment that adds to the versatility of the apparatus is provided for use in performing special tasks. For example, nozzles with jets of various sizes may be attached to the discharge pipe for road and terrain decontamination, for spraying large or small objects, or for filling small containers; a distribution pipe with atomizers may be connected to one of the discharge pipes at the rear of the truck for disseminating smoke, or it may be emplaced elsewhere and supplied through hoses leading from the cargo tank. Liquid decontaminants are conducted through hoses to decontaminate vehicles and equipment.

Major components of the ARS-12U include an oval-shaped (unpressurized) cargo tank equipped with two wave baffles, a turnover guard, body walkways, pipe handrails, a manhole, and a depth gage; a self-priming pump powered by the truck's engine through a special driveshaft, for delivering 75 to 100 gallons of water per minute at 1400 to 1600 driveshaft revolutions per minute; a double-action hand pump that delivers 12 to 15 gallons of water per minute at 45 strokes per minute; and a plumbing system consisting of metal pipes emerging from the top of the tank and bending forward and downward to connect with the power pump.

Except for minor differences, the ARS-12U is identical with the Model ARS-12D, an earlier version of the decontamination apparatus, which was mounted on the ZIL-151 chassis.

*Probably available in North Vietnam.

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FOM-2-4230-3-1

FSTC-CS-03-04-67

NOMENCLATURE: Decontamination Apparatus, Truck-Mounted, Model ARS-12U

<p>1 <u>CURRENT STATUS:</u> ----- Standard</p> <p>2 <u>MAJOR COMPONENTS:</u> ----- See text</p> <p>3 <u>CARGO TANK:</u></p> <p style="margin-left: 20px;">a Capacity-maximum ----- 680 gal</p> <p style="margin-left: 40px;">-working ----- ?</p> <p style="margin-left: 20px;">b Weight-filled ----- ?</p> <p style="margin-left: 40px;">-empty ----- ?</p> <p style="margin-left: 20px;">c Dimensions-length ----- ?</p> <p style="margin-left: 40px;">-width ----- ?</p> <p style="margin-left: 40px;">-height ----- ?</p> <p>4 <u>PUMPS:</u></p> <p style="margin-left: 20px;">a Power-driven ----- Gear-type water pump</p> <p style="margin-left: 20px;">b Hand-operated ----- Piston-type water pump</p>	<p>5 <u>PLUMBING SYSTEM:</u> ----- Rigid metal pipes</p> <p>6 <u>DECONTAMINANTS:</u> ----- See remarks</p> <p>7 <u>PERFORMANCE:</u></p> <p style="margin-left: 20px;">a Coverage ----- ? (see remarks)</p> <p style="margin-left: 20px;">b Discharge time ----- 7 to 10 min</p> <p style="margin-left: 20px;">c Discharge rate ----- 75 to 100 gal per min (max)</p> <p style="margin-left: 20px;">d Operating pressure ----- ?</p> <p>8 <u>GENERAL DATA:</u></p> <p style="margin-left: 20px;">a Carrier-type ----- ZIL-157</p> <p style="margin-left: 40px;">-capacity ----- 5400 lb liquid and equipment</p> <p style="margin-left: 20px;">b Crew ----- NCO, driver, equipment operator</p> <p style="margin-left: 20px;">c Miscellaneous equipment ----- See remarks</p>
---	--

REMARKS:

<u>Contaminated items</u>	<u>CW agents</u>	<u>Decontaminants¹</u>
Item 6. Roads and terrain	Mustard, lewisite, G-agents	Emulsion of 10% chloride of lime and 1% water glass in water
Roads and terrain	Mustard, lewisite, sarin, soman	10% solution of sulfurylchloride in dichloroethane (or petroleum)
Combat equipment and clothing	Mustard, lewisite, V-agents	10% solution of dichloramine-T in dichloroethane or in carbon tetrachloride
Vehicles and weapons	G-agents	2% sodium hydroxide, 5% monoethanolamine, and 20% ammonia in water

¹ Selected for their effectiveness against specific CW agents, as well as for their lack of destructive effects on metal and fabric.

Item 7a. A maximum of eight large items, such as vehicles or tanks, can be decontaminated simultaneously with spray from hoses hooked to a special manifold having eight outlets.

Item 8c. Six chests of ancillary equipment are carried alongside the cargo tank.

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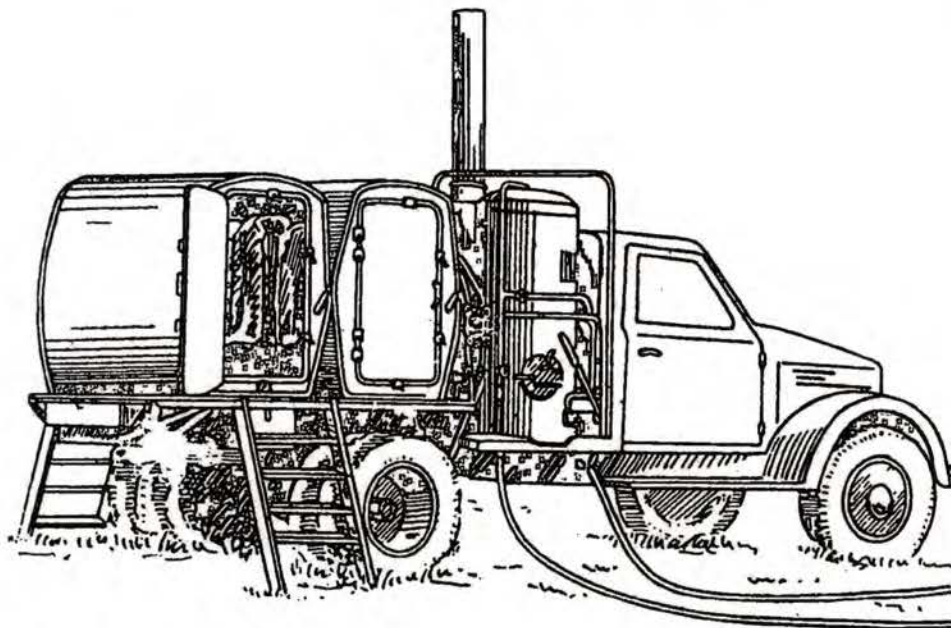
ITEM: FOM-2-4230-3-2

NOMENCLATURE: Decontamination Apparatus, Truck-Mounted, Model DDA-53

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: ДЕЗИНФЕКЦИОННО - ДУШЕВАЯ УСТАНОВКА, ДДА-53

ADOPTED: 1958



The Model DDA-53 truck-mounted decontamination apparatus, also referred to as the ADA, consists of two steam chambers, each with two pressure-tight doors; an RI-3 vertical boiler (about 53 to 79 gallons' capacity) that heats water and generates steam; a fuel-oil tank (15 gallons' estimated capacity, for 8 to 10 hours' operation); a pump for filling the system or delivering water to points of use; a formaldehyde tank; a 12-head portable shower unit; and accessories. A shower tent is transported on a cargo truck.

This apparatus can be used to steam-decontaminate clothing and equipment contaminated with CW and BW agents, and to supply hot water for shower baths and for washing contaminated equipment. For the steam-decontamination process, clothing and equipment are suspended from hangers in the chambers, and pressurized steam is admitted through pipes in the floor. Ammonia (particularly for neutralizing nerve agents), or formaldehyde (for BW decontamination), may be added to the steam through a vessel on top of each chamber. Nonspore-forming microbes are destroyed when exposed to steam at 180° F. for 0.5 hour, or to steam and 2.5 ounces of formaldehyde at 138° F. for 0.75 hour; spore-forming organisms are exposed to steam at 208° F. for 3 to 3.5 hours, or to a mixture of steam and 16 ounces of formaldehyde at 138° F. for 2.75 hours. The chambers can attain a maximum temperature of 212° F.

* Probably available in North Vietnam.

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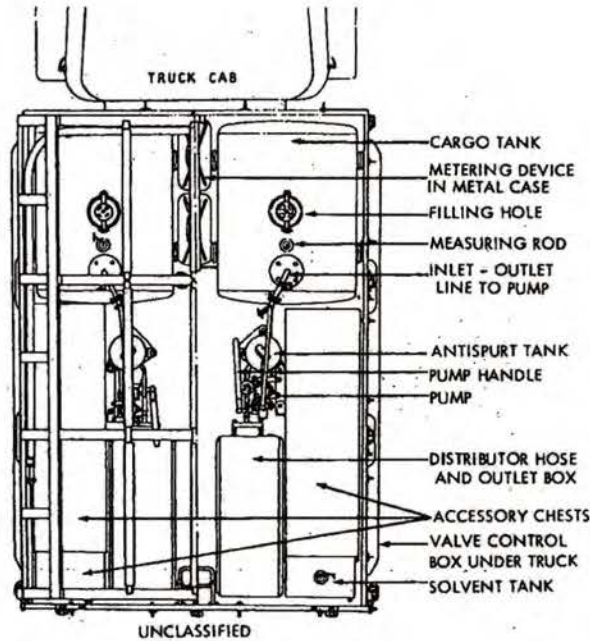
ITEM: FOM-2-4230-3-3

NOMENCLATURE: Decontamination Apparatus, Truck-Mounted, Model ADM-48D (U)

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: АВТОДЕГАЗАЦИОННАЯ МАШИНА, АДМ-48 Д

ADOPTED: Prior to 1958



(U)

(e)

b3

b3

(U) Each decontamination unit consists of a cargo tank, a hand pump, a pressure-equalizing tank to reduce surging that results from the slow-acting hand pump, a plumbing system, a metering device, accessories, tools, and spare parts. A 17-gallon, rectangular, steel tank normally filled with the solvent dichloroethane is stored on the carrier.

(U) The Model ADM-48D also supplies water for field showers and laundry facilities. It can be set up for operation in about 30 minutes, and requires about 66 square feet of working space.

* Probably available in North Vietnam.

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FOM-2-4230-3-3

FSTC-CS-03-04-67

NOMENCLATURE: Decontamination Apparatus, Truck-Mounted, Model ADM-48D (U)

(C) (U)	
1 <u>CURRENT STATUS:</u> ----- Standard	6 <u>DECONTAMINANTIS:</u> ----- See text
2 <u>MAJOR COMPONENTS:</u> ----- See text	7 <u>PERFORMANCE:</u>
3 <u>CARGO TANKS:</u>	a Coverage ----- ? (see remarks)
a Capacity-maximum ----- 264 gal (132 gal each tank)	b Discharge time ----- Varies with use
-working ----- ?	c Discharge rate ----- 26 qt per min
b Weight-filled ----- ?	d Operating pressure ----- 14 lb per sq in
-empty ----- ?	8 <u>GENERAL DATA:</u>
c Dimensions-length ----- 3.6 ft	a Carrier-type ----- GAZ-51 and GAZ-63
-width ----- 2.7 ft	-capacity ----- 2360 lb equipment and 2050 lb (264 gal) decon- tamination fluid
-height ----- 2.3 ft	b Crew ----- Crew chief, driver, and 2 chemical enlisted men
4 <u>PUMPS:</u>	c Miscellaneous equip- ment ----- See remarks
a Power-driven ----- Does not apply	
b Hand-operated ----- 2 piston-type de- contaminant pumps (Imatra, Model Nr. 2) (see remarks)	
5 <u>PLUMBING SYSTEM:</u> ----- 2 identical systems with rigid metal pipes	

REMARKS:

- Item 4b. This model, a double-action pump, is equipped with a filter, pressure gage, and three-way control valve; its suction lift is 15 feet.
- Item 7a. Twelve decontamination points may be served simultaneously by hoses extending from this apparatus; artillery decontamination kits (carried prefilled), manpack sprayers, and basins permit decontamination at many additional points.
- Item 8c. A-DK artillery decontamination sets, RDP-4 manpack sprayers, buckets, nozzles, brushes, marking stakes, protective clothing, spray hoses, measuring cups, a funnel, tools, spare parts.

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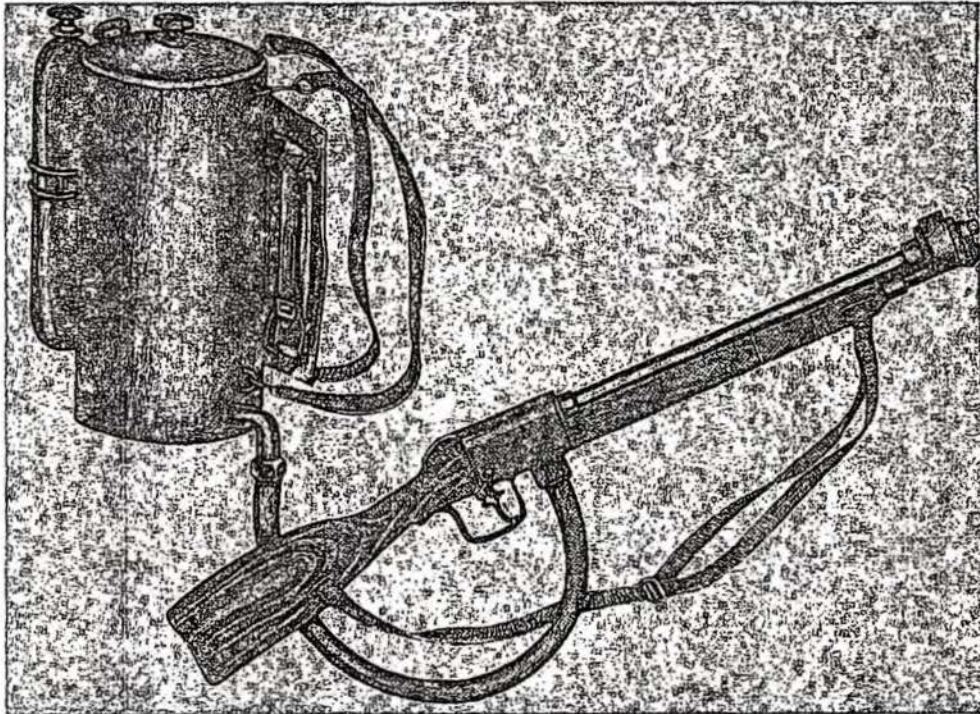
ITEM: FOM-2-1040-2-4

NOMENCLATURE: Flamethrower, Portable, Model ROKS-3

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: РАЩЕВЫЙ ОГНЕМЕТ РОКС-3

ADOPTED: Prior to 1939



The Model ROKS-3 portable flamethrower has a single cylindrical fuel tank with a filling aperture centrally located at the top, and a bottle filled with compressed nitrogen attached to the side. A spring-loaded pressure-release valve is located beside the filling aperture. A hose connects the fuel tank to the flame gun. The gun contains ten 7.62-mm ignition cartridges in an ignition cylinder that advances automatically after each shot to bring the next unfired cartridge into the firing position.

The flamethrower is operated by pulling the trigger to release the spring-loaded valve that allows the fuel to be ejected. A further pull on the trigger causes the firing pin in the bolt to come forward to strike one of the cartridges in the ignition cylinder. Flame from the cartridge is deflected into the fuel stream to insure ignition. When the trigger is released, the valve closes off the fuel supply.

The ROKS-3 is obsolete in the U.S.S.R., and has been replaced by the Model LPO-50 portable flamethrower (FOM-2-1040-2-3).

* Possibly used in North Vietnam.

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NOMENCLATURE: Flamethrower, Portable, Model ROKS-3

<p>1 <u>CURRENT STATUS:</u> ----- Obsolete in U.S.S.R.</p> <p>2 <u>USING COUNTRIES:</u> ----- Albania, Communist China, Czechoslovakia, Bulgaria, Hungary, Poland, Rumania, Yugoslavia, Egypt, North Korea ?, North Vietnam ?</p> <p>3 <u>VEHICLE MOUNT:</u> ----- Does not apply</p> <p>4 <u>FUEL:</u> ----- Petroleum with thickener</p> <p>5 <u>CAPACITIES:</u> a Fuel (total) ----- 2.1 gal b Igniters-Nr. ----- 10</p> <p>6 <u>PHYSICAL DATA:</u> a Gun length ----- 3.6 ft b Hose length ----- 3.8 ft c Tank group-height ----- 1.7 ft d -width ----- 9 in od ? e -depth ----- Does not apply f Weight-filled ----- 51.6 lb g -empty ----- 32 lb</p>	<p>7 <u>PERFORMANCE:</u> a Range-thickened fuel ----- 35 m b -unthickened fuel ----- 15 m c Duration of burst ----- 5 to 6 sec d Rate of fire ----- 0.3 gal per sec e Pressure-pressure tank --- 2200 psi f -fuel tank ----- 220 to 250 psi</p>
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FSTC-CS-03-04-67

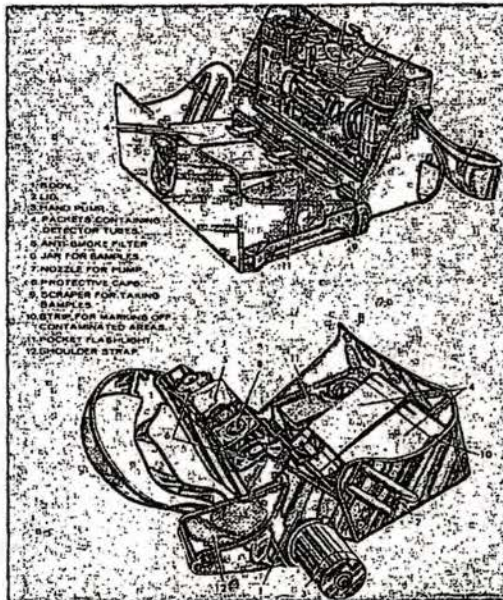
NOMENCLATURE: Detection Kit, Model PKhR-54 (U)

NATIVE DESIGNATION: ПРИБОР ХИМИЧЕСКОЙ РАЗВЕДКИ, ПХР-54

ITEM: FOM-2-6665-3-1

COUNTRY: U.S.S.R.*

ADOPTED: 1960 ?



(U)

(C) The military Model PKhR-54 detection kit can detect and identify known toxic CW agents and can sample smokes and unidentified toxic chemicals in air and on terrain and materiel. It may also be used to identify an agent which has triggered an automatic alarm, e.g., the Soviet Model GSP-1. Waist straps and a strap over the right shoulder secure the metal carrying case on the left side behind the mask. The wearer moves the case in front and opens the lid to perform tests.

(U)

(C) In the case is a hand-operated piston-type air pump with nozzle (air circulates through tubes inserted in the nozzle at about 1 liter for 25 to 30 strokes), glass indicator tubes (10 each in paper packets), smoke filters, protective gloves, tape for marking contaminated areas, flashlight, instruction sheet, report forms, trowel, and two jars for sampling. Printed instructions state the number of pump strokes for types of tubes, list temperature restrictions, include a standard agent concentration color chart for comparing color changes, and specify tube life. The smoke filters screen smoke particles before incoming air reaches the tubes, and prevent reactions between the particles and the reagents; the trapped particles may be sent to a laboratory for analysis.

(U)

(C) Each tube contains a porous material and one or two small glass ampoules of reagent near the ends. For testing, both scored ends of a tube are broken off (in a recess in the pump handle) to permit air to be pumped through, and one to five tubes are inserted in holes in a rubber stopper in the nozzle's intake. If the air is chemically contaminated, the porous material may change color (which is compared with the color chart). A metal pin in the center of each of eight color-coded holes in the pump handle punctures reagent ampoules when the tubes are inserted in the holes. The reagent released into the porous material may cause a color change when the air is pumped through. To trap an unknown agent for analysis, any tube is opened and the pump is stroked.

(U)

(C) Other detection kits which are similar to and may be identical with the PKhR-54 include Bulgaria's PKhR-50 and PKhR-51, East Germany's Chemical Indicator 54, Hungary's Model VSF Detection Instrument, and models in Poland, Communist China, North Korea, North Vietnam, and probably Rumania.

*Captured in Vietnam in 1966.

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FOM-2-6665-3-1

FSTC-CS-03-04-67

NOMENCLATURE: Detection Kit, Model PKhR-54 (U)

(U)
(C)

<p>1 <u>CURRENT STATUS:</u> ----- Standard</p> <p>2 <u>TYPE:</u> ----- Portable</p>	<p>3 <u>PHYSICAL DATA:</u></p> <p>a Appearance ----- Metal carrier</p> <p>b Dimensions-case ----- 8.25 x 4.75 x 3.5 in</p> <p>c -detector ----- Tube length, 4.5 in</p> <p>d -pump ----- Length, 7.5 in; dia, 2 in</p> <p>e Weight ----- 6 lb 3 oz</p>
---	--

Table I (C). Indicator Tube Data (U)

Ring color code	Agent	Sensitivity (mg/l)	Tube life (yr)	Color of ampoules	
				Before test	After test
One red	Sarin, soman, tabun	0.0003	2	White	Light yellow to light orange
One black	Hydrogen cyanide	0.005	5	White	Pale violet to violet
One green	Phosgene, diphosgene, chloropicrin	0.005	5	White	Green to blue-green
Two green	Cyanogen chloride	0.008	2	White	Pink to red-raspberry
One yellow	Sulfur mustard	0.003	1	Lemon-yellow	Red on yellow background
Two yellow	Nitrogen mustard	0.001	5	White	Orange-red on yellow background
Three yellow	Lewisite	0.002	3	White	Red
One white	Chloroacetophenone	0.0001	5	White	Pink to raspberry
Two white	Adamsite	0.0002	5	White	Green
Three green*†	Phosgene, diphosgene, hydrogen cyanide, cyanogen chloride	0.005	2	White	Green or light green on white
		0.005	2	White	Red to violet on white
		0.008	2	White	Red to violet
One red with red dot*	Soman	0.00005	1	White	Red if agent is present; yellow if agent is absent

* These tubes may or may not be included in the Model PKhR-54 kit.

† This tube may be found in some kits in place of the one green band, one black band, and two green band tubes which it replaces.

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FSTC-CS-03-04-67

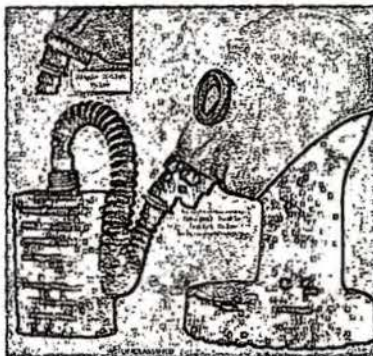
ITEM: FOM-2-4240-1-1

NOMENCLATURE: Mask, Protective, Model ShM-1 (U)

COUNTRY: U.S.S.R. *

NATIVE DESIGNATION: ШЛЕМ-МАСКА, ШМ-1

ADOPTED: After 1950



(U)
(S) The Model ShM-1 protective mask (Shlem-Maska), with double outlet valve and MO-2 or MO-4U canister, affords excellent protection against all CW agents (including G and V types) and most candidate BW agents. The complete mask assembly consists of a hood-type facepiece, hose, canister, carrying bag, and small incidental equipment such as antidim disks. In unusual circumstances, the canister may be attached directly to the facepiece. With aging, the facepiece changes from light gray to tan, but the change does not indicate significant deterioration.

(U)
(S) Two 2.75-inch-diameter glass lenses in metal eyelens holders permit a fairly good field of vision. Influent air, led through rubber ducts integrally molded to the interior of the facepiece, is discharged into the mask directly over the lenses to inhibit fogging. To further inhibit fogging, removable, transparent, gelatin-coated antidim disks may be inserted against the inner surfaces of the lenses and held in place by metal hoops inserted in the eyelens holders. The facepiece and hose stiffen at very low temperatures and require careful handling--and sometimes preheating--to prevent cracking. At high temperatures, profuse sweating of the head and face and other discomforts may occur.

(U)
(S) An intake-outlet valve assembly is contained in a metal housing integrally attached to the facepiece at the chin position. A detachable rubber hose conveys filtered air to the intake valve from the canister. Early Shlem-1 masks (appearing about 1940) were equipped with a single outlet valve which permitted a small, but possibly dangerous, amount of unfiltered air to flow into the facepiece as the valve closed. The backleakage was reduced significantly about 1950 by providing a second outlet valve contained in a flexible rubber adapter. To attach the adapter, the canister is removed from the hose and the hose is pulled through the adapter until the adapter reaches the outlet valve housing; the adapter's large end is then forced upward around the metal outlet valve housing to fit tightly around it and around the hose. Exhaled air passes through the two valves and exits through a port in the adapter. Atmospheric pressure closes the outermost valve slightly ahead of the inner valve so that inrushing air is trapped between the two valves and is forced out with the next exhalation. Use of the adapter reduces the amount of backleakage from 0.933% to 0.006% at an average breather pump rate of 31.6 liters per minute (in the latest masks equipped with the integral double outlet valve, backleakage is only 0.005%).

(U)
(S) The green canvas bag carrier is equipped with a shoulder strap, a waist strap, a flap which fastens with a strap and buckle, an internal partition which separates the canister from the facepiece and which contains a pocket for antidim disks, and a tie string which holds the canister in place. Two wooden blocks (or sometimes a metal spring) separate the bottom of the canister from the bottom of the carrier and provide a passageway for air into the canister. Other types of carriers may be in use; one is about 11-1/2 x 11-1/2 x 5-1/4 inches and has a pocket in the front for a protective cape and a self-aid kit.

* Masks (with Model MO-4U canister) captured in Vietnam in 1966.

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FOM-2-4240-1-1

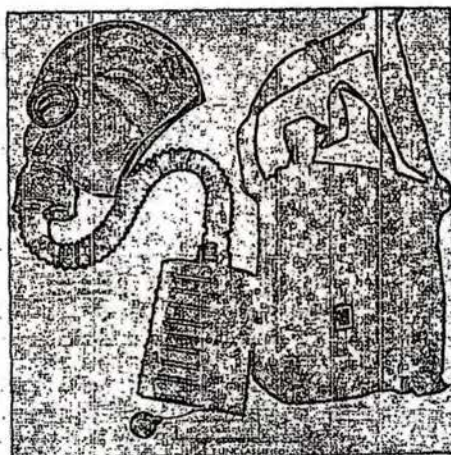
FSTC-CS-03-04-67

NOMENCLATURE: Mask, Protective, Model ShM-1 (U) (U)

<p>1 <u>CURRENT STATUS:</u> ----- Standard</p> <p>2 <u>MATERIALS:</u></p> <p>a Facepiece ----- Natural rubber</p> <p>b Canister ----- Sheet metal</p> <p>c Hose ----- Cloth-covered buna S, a copolymer of butadiene and styrene</p> <p>d Carrier ----- Canvas</p> <p>3 <u>DIMENSIONS:</u></p> <p>a Facepiece ----- 0 through 4 (see remarks)</p> <p>b Canister ----- MD-2, 5.2 x 2.8 x 7.8 in; MD-4U, 5.3 x 2.6 x 8.0 in</p> <p>c Hose ----- Length, 21 in; dia, 1.25 in</p> <p>d Carrier ----- Height, 9.75 in; length, 8.75 in; width, 2.50 in</p> <p>4 <u>WEIGHT:</u></p> <p>a Facepiece ----- 13 to 15.3 oz</p> <p>b Canister ----- MD-2, 31.8 oz; MD-4U, 30.8 oz</p> <p>c Hose ----- 6 to 7.7 oz</p> <p>d Carrier ----- 8.5 to 18 oz</p>	<p>5 <u>PERFORMANCE:</u></p> <p>a Visibility ----- 21 to 39.7% unimpaired field of vision</p> <p>b Comfort ----- Uncomfortable at above-moderate temperatures</p> <p>c Communication ----- Speaking, vocal range, 30 ft ?; Hearing, impaired slightly because facepiece covers ears</p> <p>d Facepiece penetration ----- Impervious to mustard and sarin for more than 24 hr at 113° F</p> <p>e Leakage-peripheral ----- Insignificant around facepiece and lenses</p> <p>f -outlet valve ----- 0.005%</p> <p>g Effect of cold-hose ----- Stiffens</p> <p>h -eyepiece ----- Fogging and icing at -25° to -40° F</p> <p>i -facepiece ----- Danger of cracking at -25° F</p> <p>j -deflector tubes ----- Danger of cracking at -25° F</p>
--	---

REMARKS:

Item 3a. Size is based on the sum of two linear measurements: one encompassing the chin, cheeks, and top of head and the other encompassing the forehead, both ear apertures, and the back of the head. Size 0, 93 cm; 1, 93 to 95 cm; 2, 95 to 99 cm; 3, 99 to 103 cm; 4. > 103 cm.



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FSTC-CS-03-04-67

NOMENCLATURE: Canister, Model MO-4U(U)

NATIVE DESIGNATION: КОРОБКА МО-4У

ITEM: FOM-2-4240-2-6

COUNTRY: U.S.S.R.*

PRODUCED: 1951 ?



(U)
(C) The Model MO-4U, the latest known Soviet protective canister, provides excellent protection against all Western CW agents, including G- and V-type nerve agents, and will filter out BW aerosols as well as alpha and beta particles of 0.3-micron size and larger. This olive-drab, enameled canister has a screwcap and rubber plug (for the influent opening), which exclude air and moisture until time of use, and a pleated, paper particulate filter whose construction differs from that of the paper filter used in the MO-2 (FOM-2-4240-2-2). A groove in its elliptical shell distinguishes it from the MO-2, which it may gradually be replacing.

(U)
(C) A comparison of laboratory analyses of both models reveals that the MO-4U does not perform significantly better than the MO-2. Its charcoal impregnant, however, contains a higher percentage of copper and hexavalent chromium and, consequently, provides greater protection against hydrogen cyanide and cyanogen chloride. Breathing resistance may also be reduced by the type and arrangement of paper filter used in the MO-4U canister.

(U)
(C) Because of the simpler construction of its paper particulate filter, the MO-4U is probably more economical to produce than the MO-2.

* Captured in Vietnam in 1966.

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FOM-2-4240-2-6

FSTC-CS-03-04-67

NOMENCLATURE: Canister, Model MO-4U(U)

(U)

<p>1 <u>CURRENT STATUS:</u> ----- Standard</p> <p>2 <u>WEIGHT:</u> ----- 28.7 oz (813 gm) to 30.8 oz (873 gm)</p> <p>3 <u>MATERIALS:</u> a Container ----- Sheet metal b Absorbent ----- Charcoal</p> <p>4 <u>DIMENSIONS:</u> a Length ----- 5.3 in b Width or max. dia. ----- 2.7 in c Height ----- 8.5 in (including threaded nipple)</p> <p>5 <u>ABSORBENT:</u> a Type ----- Impregnated, activated, extruded charcoal b Weight ----- 14 to 15 oz c Volume ----- 28.2 to 40.2 cu in d Hardness ----- 32 to 92 e Impregnants ----- See remarks f Apparent density ----- 0.62 gm per cc to 0.68 gm per cc g Spectrographic analysis --- See remarks</p>	<p>(C)</p> <p>6 <u>PARTICULATE FILTER:</u> a Type ----- Vertically pleated b Material ----- Absorbent white paper c Height ----- 2.25 in d Effective area ----- ?</p> <p>7 <u>PERFORMANCE:</u> a DOP penetration ----- 0.001% to .004% for 0.3-micron particles at flow rate of 32 liters per min b Air resistance ----- 55 to 80 mm H₂O at flow rate of 85 liters per min c Resistance to cml agents --- See remarks</p>
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REMARKS:

Item 5e. Quantitative analysis of charcoal layer:

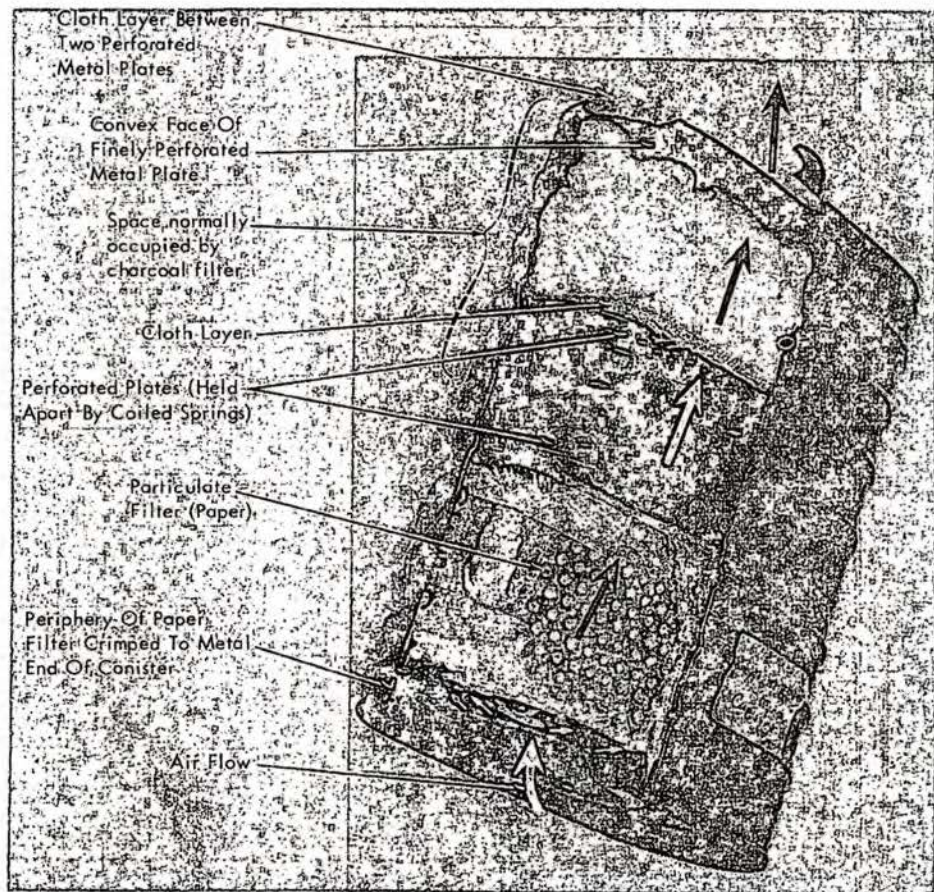
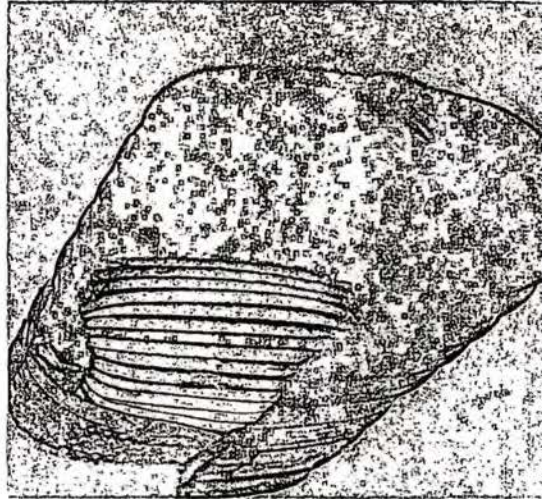
Barium oxide	< 0.1%	to	1.0%
Calcium oxide	0.1%	to	1.0%
Cupric oxide	5.4%	to	9.6%
Chromic oxide	0.6%	to	4.3%

Item 5g. Quantities of less than 0.1% of silver, aluminum, iron, magnesium, silicon, and tin were found in the charcoal layer.

Item 7c.

	<u>CK</u>	<u>PS</u>
Tested at flow rate of 32 liters per min in agent concentrations of (mg/liter)	4.0	50
Minutes to chemical breakpoint	70 to 90	30 to 60

NOMENCLATURE: Canister, Model MO-4U



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FSTC-CS-03-04-67

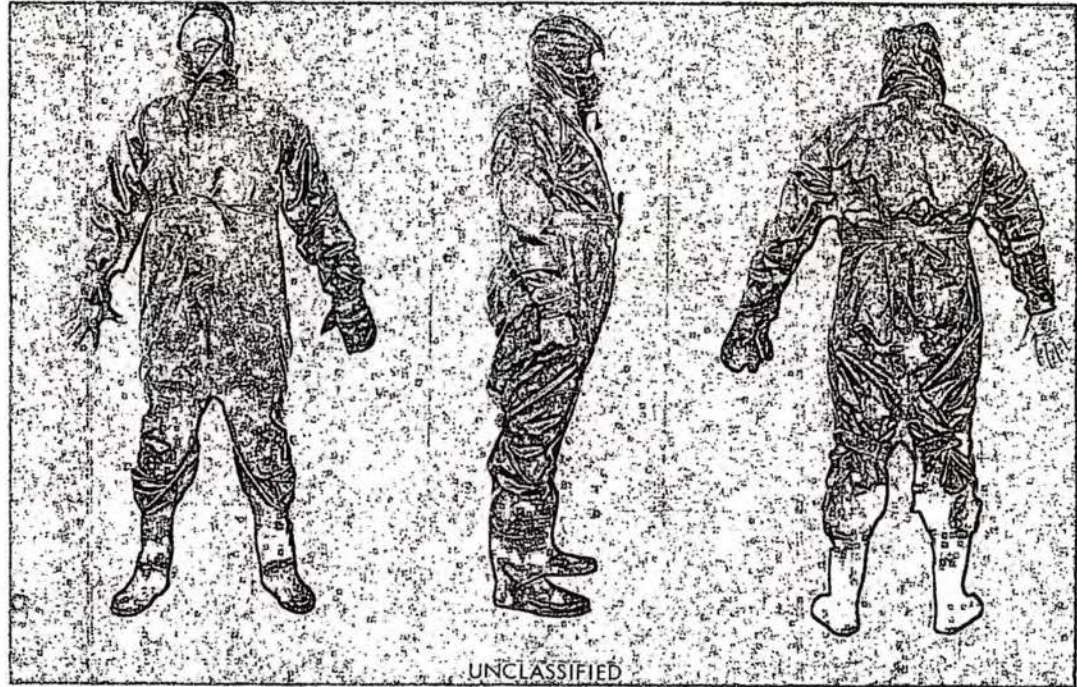
ITEM: FOM-2-8415-4-12

NOMENCLATURE: Coveralls, Rubberized, Lightweight, With Integral Hood and Boots, Model ? (U)

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: ?

ADOPTED: 1955 or earlier



(U)

~~(C)~~ The Soviet lightweight, protective coveralls are made of rubberized fabric reinforced at the elbows and knees. Molded to the garment and made of the same material are a hood and boots, and adjustable straps, secured by stud-type fasteners, at the outer sleeve cuffs and behind the knees. The front opening, which extends from the crotch to the hood, has an inner flap, several inches wide, to which five stud-type fasteners are bonded; the fasteners mate with holes in the overlapping portion of the front opening. The sleeves are designed with elastic inner wristbands, and the hood with elastic inner strips, to assure a tight fit. A belt is also provided.

(U)

~~(C)~~ The coveralls, plus protective gloves and a protective mask, afford excellent protection against liquid CW agents; chemically impregnated clothing must also be worn, however, to protect the body from vapors and aerosols entering through openings.

* Captured in Vietnam in 1966.

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FOM-2-8415-4-12

FSTC-CS-03-04-67

NOMENCLATURE: Coveralls, Rubberized, Lightweight, With Integral Hood and Boots, Model ? (U)

(U)
(C)

1	CURRENT STATUS: ---- Standard	3	PERFORMANCE:
2	PHYSICAL DATA:		a Liquid agent penetration ---- See remarks
a	Material ----- Rubberized fabric (neoprene ? and rayon ?)		b Effects of cold ----- See remarks
b	Color ----- Green body; black boots		c Tensile strength ----- Satisfactory
c	Weight ----- 6.7 lb		d Tear resistance ----- Satisfactory
d	Dimensions ----- See remarks		e Breaking strength ----- Satisfactory

REMARKS:

Item 2d. An exploit~~ed~~ garment (size unknown) had the following dimensions (in inches):

Average thickness	
Body of coveralls	0.021
Boots	0.076
Overall length	73
Inseam length	34
Hood length	13
Sleeve length	21
Sleeve width	10
Sole length	11
Sole width	4.3

Item 3a. The rubberized fabric provides excellent resistance to liquid CW agent penetration. Laboratory tests showed the following:

Temperature (deg F.)	Humidity	Resistance to CW agents (min)		
		Mustard	Sarin	VX
160	Negligible	330	> 1320	> 1320
115	85% RH	400	> 1320	> 1320
-40	Negligible	380	> 1320	> 1320

Item 3b. Tested under varying conditions, ranging from tropical temperatures to -40° F., the material remained serviceable; no brittleness, cracking, softening, or separation of layers occurred.

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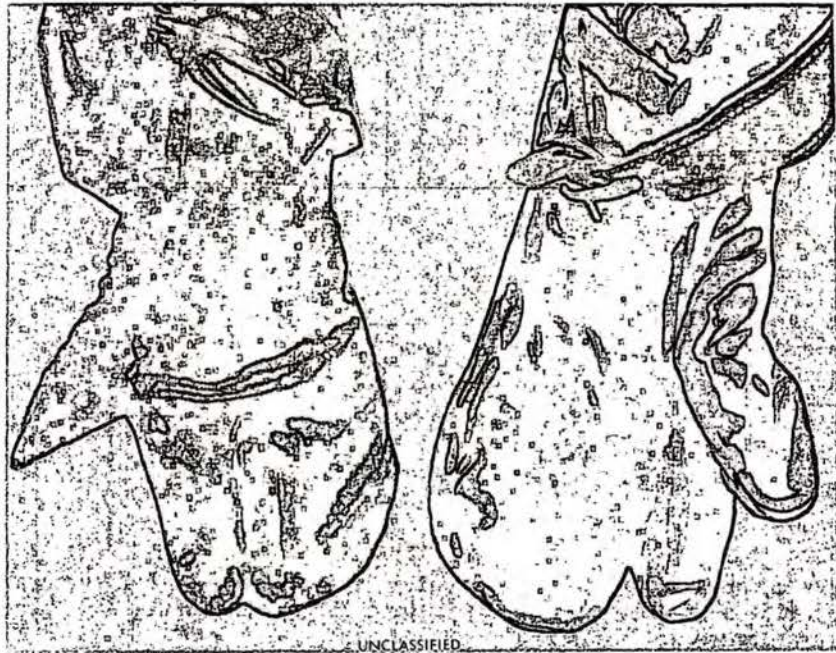
ITEM: FOM-2-8415-6-1-1

NOMENCLATURE: Glove, Protective, Rubberized Fabric, Two-fingered, Model ? (U)

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: ?

ADOPTED: 1960 ?



(U)
~~(C)~~ The Soviet two-fingered CW protective glove is made of rubberized fabric that is reinforced at the seams. It extends to the wrist, where it is tied to a strap on the jacket sleeve by a fabric loop. The loose closure at the wrist may admit toxic vapors and aerosols.

(U) On issue since 1966, this model of protective glove may now be replacing one or more older (lighter and heavier) types.

* Captured in Vietnam in 1966.

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FOM-2-8415-6-1-1

FSTC-CS-03-04-67

NOMENCLATURE: Glove, Protective, Rubberized Fabric, Two-fingered, Model ? (U)
(U)

(C)

1	CURRENT STATUS: ---- Standard	3	PERFORMANCE:
2	PHYSICAL DATA:	a	Liquid agent penetration ---- See remarks
a	Material ----- Rubberized fabric (neoprene ? and rayon ?)	b	Effects of cold ----- See remarks
b	Color ----- Green	c	Tensile strength ----- Satisfactory
c	Weight ----- 2.7 oz each	d	Tear resistance ----- Satisfactory
d	Dimensions ----- Length, 11.8 in; width, 5.3 in; thickness, 0.021 in	e	Breaking strength ----- Satisfactory

REMARKS:

Item 3a. The rubberized fabric provides excellent resistance to liquid CW agent penetration. Laboratory tests showed the following:

Temperature (deg F.)	Humidity	Resistance to CW agents (min)		
		Mustard	Sarin	VX
160	Negligible	330	> 1320	> 1320
115	85% RH	400	> 1320	> 1320
-40	Negligible	380	> 1320	> 1320

Item 3b. In tests under varying conditions, which ranged from tropical temperatures to -40° F., the material remained serviceable; no brittleness, cracking, softening, or separation of layers occurred.

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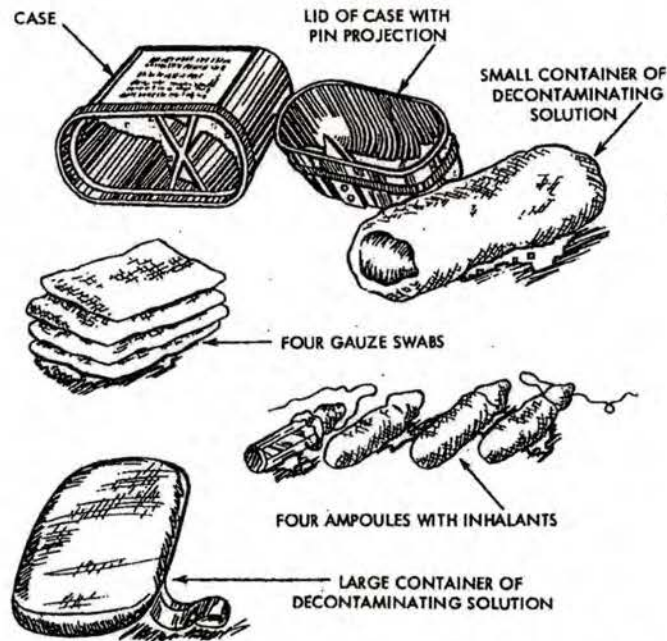
ITEM: FOM-2-4230-1-7

NOMENCLATURE: Decontamination Kit, Individual, Model IPP

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: ИНДИВИДУАЛЬНЫЙ ПРОТИВОХИМИЧЕСКИЙ ПАКЕТ, ИПП

ADOPTED: 1960 ?



The Model IPP CW kit has two plastic vials of chemicals intended for skin and clothing decontamination. The smaller vial contains a liquid decontaminant ready for use against nerve agents. The larger vial, filled with a solvent and a glass ampoule of powder, must be squeezed until the ampoule is crushed and the powder is released into the surrounding solvent to produce a solution for neutralizing mustard and lewisite.

Other components of the kit are four antismoke ampoules and gauze pads. One antismoke ampoule is inserted into the protective mask facepiece, crushed, and inhaled to nullify the effects of irritant smoke.

The IPP, possibly also referred to as the IPP-51, differs from an earlier and probably obsolete model, the IPP-3, which did not contain a nerve agent decontaminant.

* Captured in Vietnam in 1966.

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FOM-2-4230-1-7

FSTC-CS-03-04-67

NOMENCLATURE: Decontamination Kit, Individual, Model IPP

1 <u>CURRENT STATUS:</u> ----- Standard	3 <u>WEIGHT OF KIT:</u> ----- 8.8 oz
2 <u>CARRYING CASE:</u>	4 <u>DECONTAMINANTS:</u>
a <u>Material</u> ----- Plastic	a <u>Type</u> ----- See remarks
b <u>Dimensions</u> ----- 8.5 x 3.5 x 1.5 in	b <u>Quantity</u> ----- See remarks

REMARKS:

	<u>CW agents</u>	<u>Decontaminants</u>
Items 4a and 4b.	Nerve	42.0 ml water-ammonia solution
	Vesicant	17.0 gm chloramine-B in 57.0 ml aqueous alcohol
	Irritant smoke (i.e., adamsite)	Inhalant compounded of 40 ml ethanol, 40 ml chloroform, 20 ml ethyl ether, and 10 drops strong ammonia water (each ampoule contains 1 ml of the compound)

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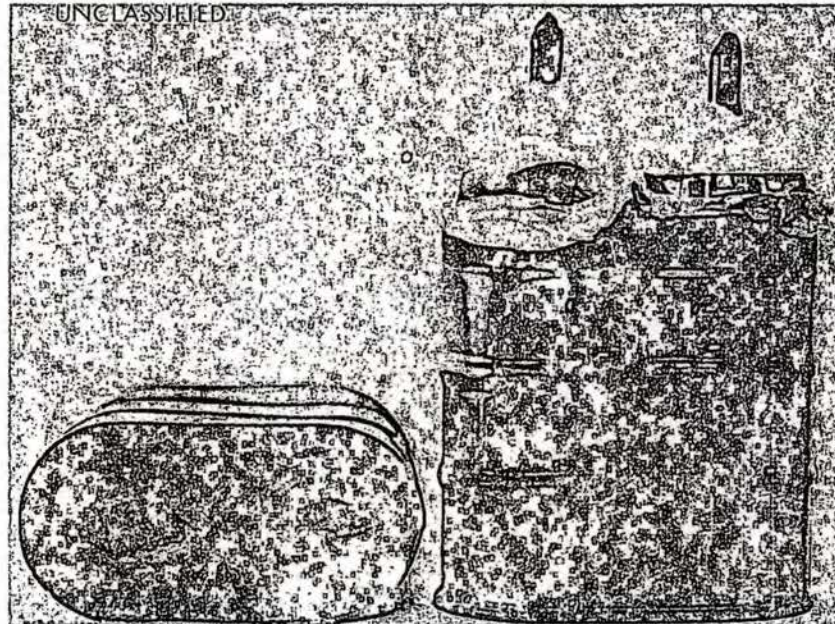
ITEM: FOM-2-4230-1-8

NOMENCLATURE: Decontamination Kit for Personal Weapons, Model ? (U)

COUNTRY: U.S.S.R.*

NATIVE DESIGNATION: ИНДИВИДУАЛЬНЫЙ ДЕГАЗАЦИОННЫЙ ПАКЕТ

ADOPTED: Prior to 1960



(U)

~~(S)~~ The CW decontamination kit for personal weapons consists of two glass ampoules of solutions for decontaminating vesicant and nerve agents, five paper towels, and a green metal carrying case with instructions glued to one side and with the numerals "1" and "2" embossed on the other side. The ampoule sealed with a red stopper is believed to be positioned in the carrying case at 1, and the black-tipped ampoule at 2.

* Captured in Vietnam in 1967.

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FOM-2-4230-1-8

FSTC-CS-03-04-67

NOMENCLATURE: Decontamination Kit for Personal Weapons, Model ? (U)

(C) (U)			
1	CURRENT STATUS: ---- Standard	3	WEIGHT OF KIT: ----- 9.3 oz
2	CARRYING CASE:	4	DECONTAMINANTS:
a	Material ----- Metal	a	Type ----- See remarks
b	Dimensions ----- 5.2 x 3.0 x 2.4 in	b	Quantity ----- 2 fl/oz each ampoule

REMARKS:

Item 4a. The red-tipped ampoule contains the Soviet Decontamination Solution No. 1, probably an 8% solution of DT-6 (hexachloromelamine) in dichloroethane, which is used against vesicants and V-type nerve agents. The black-tipped ampoule is filled with the Soviet Decontamination Solution No. 2, probably an ammonia/water solution containing 2% sodium hydroxide, 5% monoethanolamine, and 20% ammonia in water, which is used against G-type nerve agents.

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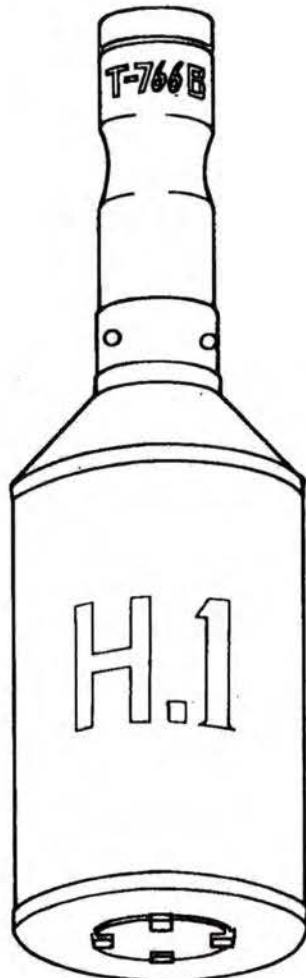
NOMENCLATURE: Grenade, Hand, Tear Agent CS, Model T-766B ? (U)

NATIVE DESIGNATION: ?

ITEM: FOM-9-1330-1-7

COUNTRY: North Vietnam

ADOPTED: 1966



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(U)

~~(C)~~ The Model T-766B (?) hand grenade is a cylindrical canister filled with the chemical agent CS and fitted with a throwing handle and a firing and bursting assembly. The thin sheet-metal canister has a soldered seam and crimped-on ends. The wooden handle and the canister end to which it is attached are wax coated to exclude moisture. A filling aperture at the opposite end of the canister is sealed by a metal disk and an underlying rubber disk, which are held in place by four fold-down metal tabs. The firing mechanism, housed partly in the handle and partly in the canister, consists of a pull-wire, a powder-train delay, a blasting cap, and a metal container filled with a small amount of TNT powder and two TNT pellets (0.4 oz). The grenade explodes violently to disseminate the filling, which quickly incapacitates unmasked personnel, but is not lethal. Even in low concentrations, CS causes lachrymation and a burning sensation in the eyes, nose, and throat and on exposed body surfaces.

(C) This grenade is believed to be a converted HE offensive-type grenade, in which the filling has been replaced with CS; its shape is similar to that of the standard Viet Cong hand grenade. The quality of construction indicates a well-developed manufacturing process.

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FSTC-CS-03-04-67

NOMENCLATURE: Grenade, Hand, Tear Agent CS, Model T-766B ? (U)
(U)

1	CURRENT STATUS: ----- Improved ?	3	PERFORMANCE:
2	CHARACTERISTICS:	a	Average range thrown ----- ?
a	Type ----- Tear agent	b	Fragmentation radius ----- Does not apply
b	Weight ----- 12.5 oz	c	Penetration ----- Does not apply
c	Length ----- 10.7 in	d	Burning time ----- Does not apply
d	Maximum diameter ----- 2.7 in		
e	Body material ----- Sheet metal		
f	Filler-weight ----- 5.1 oz		
g	Filler-material ----- CS (o-chlorobenzyl- malononitrile)		
h	Fuze-type ----- Pull friction		
i	Fuze-delay time ----- 3 sec		
j	Nr. fins ----- Does not apply		
k	Identifying markings --- See remarks		

REMARKS:

Item 2k. The canister is painted light green, with a narrow white stripe encircling each end near the crimping. Markings on the canister (H.1) and on the handle (T-766B) are white on black.

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FSTC-CS-03-04-67

NOMENCLATURE: Grenade, Napalm

(U)

~~(C)~~ A Viet Cong incendiary grenade, filled with a mixture of napalm and Kapok fiber, is mechanically identical with the grenade filled with a phosphorus and napalm mixture, but is smaller. The napalm/Kapok grenade is 6.5 inches long and has a diameter of 1.75 inches. The grenade can be thrown by hand, or can be propelled from a homemade launcher adapted to the French MAS-36 rifle. The device was last reported in 1962. Information is not available regarding place of origin, quantities produced, and stocks on hand.

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FSTC-CS-03-04-67

NOMENCLATURE: Grenade, White Phosphorus

(U)

(C) An undisclosed number of hand grenades, shaped like beer cans and equipped with handles, were captured in February 1967. The grenades were filled with plasticized white phosphorus. A tested sample had the following characteristics: The galvanized, sheet-metal canister is soldered along the seams, is equipped with a round filler plug in the bottom end, is 4.5 inches long, and has a diameter of 2.5 inches. The body and the fuze handle are dip painted with dark green enamel. A galvanized-metal fuze well (soldered into the top of the canister) separates the booster/initiator from the filler; the booster material appears to be a mixture of pitch and an unidentified explosive. The initiator is a homemade Viet Cong, percussion-type grenade fuze with a black powder time-fuze-delay element. A homemade blasting cap is taped to the fuze body. More detailed information is not available.

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FSTC-CS-03-04-67

NOMENCLATURE: Grenade, White Phosphorus and Napalm

(U)

~~(C)~~ This Viet Cong incendiary grenade is filled with a white phosphorus and napalm mixture. The light metal cylinder is equipped with a fuze assembly which protrudes from the top end and a lead plug which is inserted in an opening in the bottom end. The green-painted body is 10.75 inches long and has a diameter of 2.25 inches. The device weighs 1 pound when empty (filled weight is unknown). The fuze, a "setback" type, is activated by removing a small nail, or pin, and striking the bottom of the grenade against the ground; the force causes a striker to compress a retaining spring and strike a detonator in the fuze assembly. The fuze has a 4-second delay. The grenade can be thrown by hand or propelled by a homemade launcher adapted to the French MAS-36 rifle. The device was last reported in 1962. Place of origin and quantities produced and on hand are unknown.

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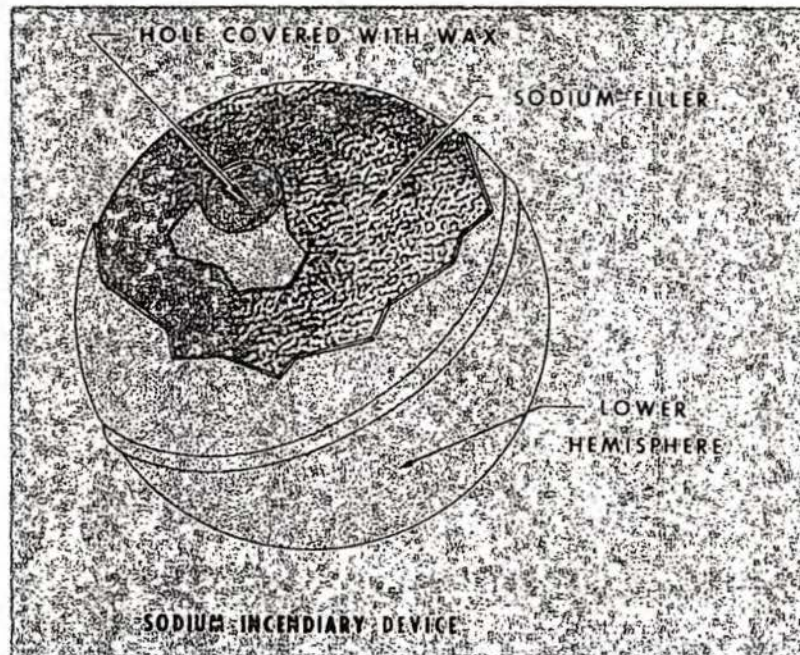
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NOMENCLATURE: Sodium Incendiary Device



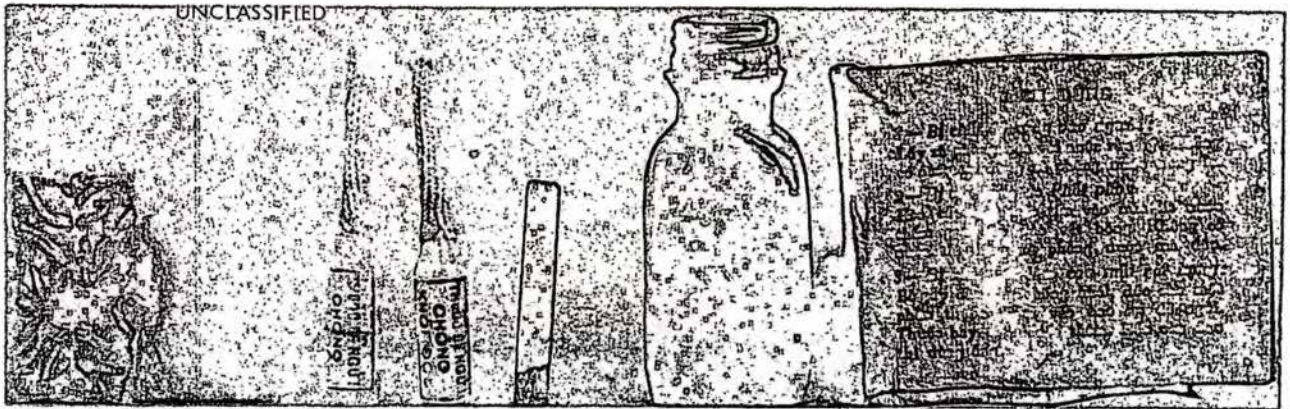
(U) The sodium incendiary device shown above is a sabotage weapon constructed of two sheet-metal hemispheres which have been welded together. Each hemisphere has a hole covered with wax and paper to exclude moisture. The device contains sodium suspended in a tarlike substance. When the device is emplaced in water, the wax and paper seals are removed to permit entrance of moisture. The subsequent water/sodium reaction produces smoke and flame through the two holes for 4 to 5 seconds, to a distance of about 1 yard. The case, which remains intact after the contents have burned out, smells of kerosene and feels as if it were covered with soap. The device is especially effective in areas that are subject to gas or oil seepage, and may be placed in boat bilges or in containers of water to ignite flammable materials in depots. The spherical body has a diameter of 1.5 inches and weighs 1.5 ounces; the metal case is approximately 0.32 inch thick. Specific instances of use have not been reported; quantities on hand, quantities produced, and place of origin are unknown.

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FSTC-CS-03-04-67

NOMENCLATURE: Decontamination Kit (with Antismoke Mixture)



(U)

(C) A paper-wrapped kit shown above, probably produced in North Vietnam, contains a bar of soap, a bottle of liquid soap, a glass vial (0.5 gram) of powdered potassium permanganate ($KMnO_4$), two glass ampoules (believed to contain Soviet "antismoke" mixture), a wad of cotton, and an instruction sheet. These items have not been seen grouped together in any other type of self-treatment kit. The kit may have been devised to meet needs deemed especially important by NVA personnel, but could not satisfy all uses designated in the instruction sheet, such as "Counteract all kinds of toxic chemicals" or "Extinguish burning phosphoric fragments stuck to the body." The kit could be useful, however, for washing napalm and phosphorus burns and other wounds. One part of $KMnO_4$ in 1000 parts of water is mildly antiseptic but quickly loses its effectiveness in solution, especially when the water contains antagonistic chemicals. Soviet "antismoke" ampoules contain a mixture of ethanol, chloroform, ethyl ether, and ammonia water. The mixture is used as an inhalant to lessen the discomfort in nose and throat caused by irritating or lachrymatory agents. When the ampoule is broken in its gauze cover, the inhalant may be breathed directly; if a protective mask is available, the ampoule can be placed inside the facepiece where the inhalant mixes with the influent air. At least a few thousand of these kits are believed available.

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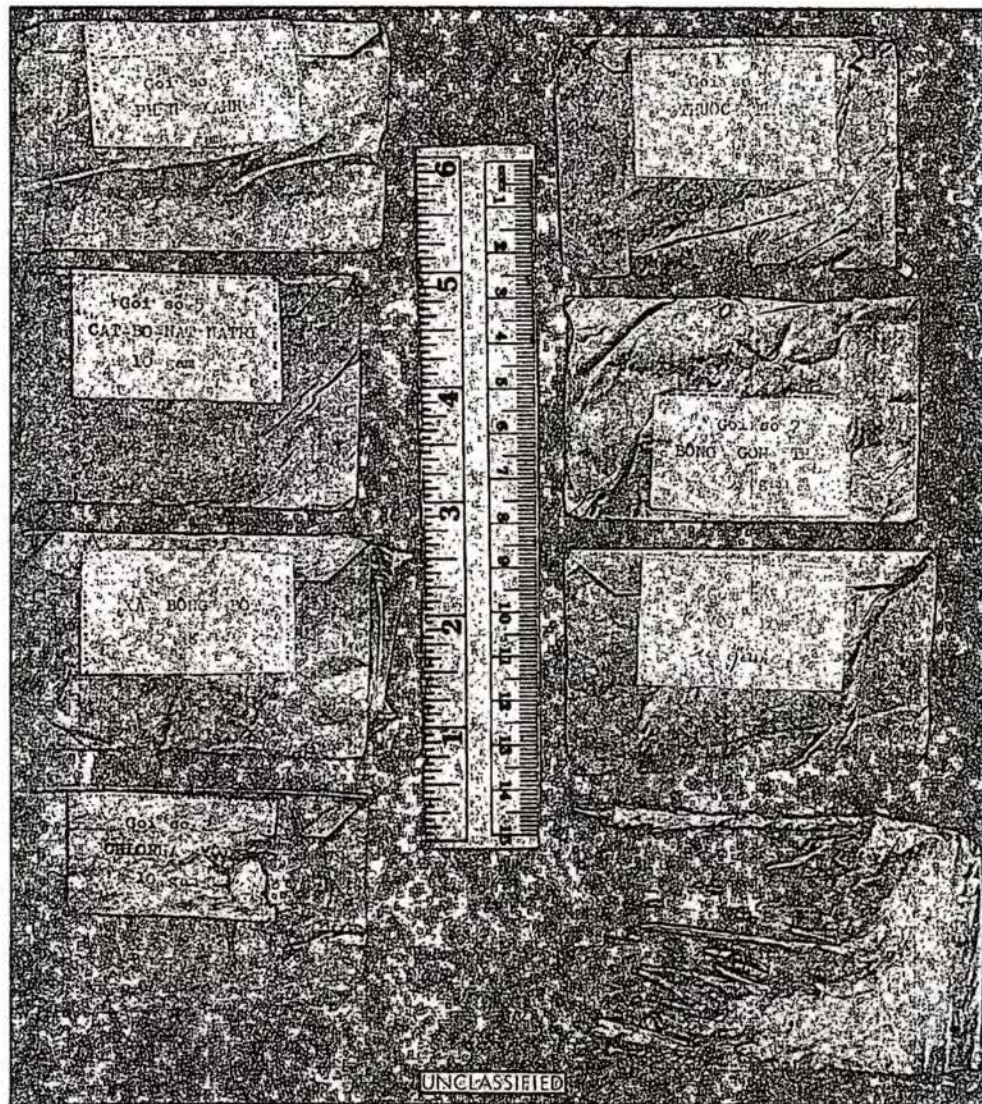
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NOMENCLATURE: Self-Treatment Kit Containing Seven Packets



(U)

(C) The kit comprises seven paper packets (numbered 1 through 7) and an instruction sheet, packed in a plastic bag. Each packet contains decontaminating material in a sealed plastic bag which is inside a sealed, brown rice paper envelope (see illustration above). Most of the decontaminants would be at least partially effective if used in the manner prescribed. The translated instruction sheet reads as follows:

Guide for Use of Individual Antiseptic Bag

1. Method of Use: It is recommended that this bag be used to eliminate toxic chemicals (liquid or powder) on human skin, weapons or equipment.

Caution: Do not drink this as an antidote.

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NOMENCLATURE: Self-Treatment Kit Containing Seven Packets

2. Composition: This antiseptic bag comprises seven different medicines:

Pack #1: Powdered lime (10 grams) to be used as an antidote against nerve poisons on the skin.

Pack #2: Lime chlorure* (10 grams) to be used on the stocks of rifles and/or on mortar plates.

Pack #3: Permanganate (5 grams) to be used against itching materials on the skin.

Pack #4: Powdered soap (5 grams) to be used as an antidote for the above mentioned poison and for cleaning the infected area after the antidote is applied.

Pack #5: Carbonate natri** (10 grams) to be applied on the face (mouth or nose) whenever a mask against contagion is not available and is recommended for cleaning the mouth and the face after being infected.

Pack #6: Copper sulfate (5 grams) to be used to extinguish white phosphorus on skin, weapons and equipment.

Pack #7: Hydrolic*** cotton (5 grams) to be used to absorb liquid or powdered poisons and for applying the antidote.

Time required for antitoxin: Take advantage of a lull in combat to remove contamination as soon as possible. Decontamination should be performed within 5 minutes after contamination occurs.

3. Antisepsis: If the poison on your skin, weapons or equipment is a liquid or powder, it is recommended that the poison be absorbed and the area cleaned, by applying the cotton in pack #7 before applying the antidote.

Caution: Apply it carefully to prevent spreading the poison over additional area. The following steps of antisepsis are recommended:

a. Persons infected by liquid or powdered poisons:

- Mix powdered lime (in pack #1) with water (one part lime to 10 parts water), stir well, apply to a piece of cotton and then apply it many times on the infected area, after first treating the area with lime water for 5 minutes. Mix soap (pack #4) with water and clean out the disinfected area. Repeat the process on other infected areas.

- If white phosphorus is stuck to the skin and smoking, make a copper sulfate (pack #6) solution, one part copper sulfate to 10 parts water, stir it well, soak into a piece of cotton and apply the solution to the injured area until the smoking stops. Finally, cover the wound with a piece of cotton saturated with the solution and with clean bandages. Remove the bandages after 20 minutes and clean the area with soap and water.

- If no mask is available, mix (one part) carbonate natri (sodium carbonate) with water (five parts), stir well, saturate your towel with the solution and cover your mouth and nose with it. Clean your mouth and face with the towel as soon as you depart the contaminated area.

Caution: Keep this solution out of your eyes.

*Believed to be chloride of lime.

**May be an error in translation. Found, in U.S. laboratory tests, not to be carbonate natri but to have a high sodium sulfate content and chromium impurities.

***Absorbent.

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NOMENCLATURE: Self-Treatment Kit Containing Seven Packets

b. Weapons infected by liquid or powdered poison.

- Metal equipment, like humans, may also be contaminated. After decontaminating weapons they should be lubricated and greased to prevent rusting.

- Mix chlorure (lime, in pack #2) with water (one part lime to five of water) and apply the solution to wooden articles. Repeat the treatment but do not apply oil.

4. Maintenance and care:

- Do not store the chemical solution in a humid place.

- Keep it away from heat and direct sunlight because heat reduces its effectiveness.

- When using the solution do not mix excessive quantities but follow the instructions given above.

- Check it frequently and if the nylon cover (?) is torn replace (it with another packet ?).

(U)

~~(C)~~ Upon exploitation the seven-packet kit was found to have the following characteristics:

Packet #1. Powdered lime in this packet would be effective mainly as an absorbent material and to collect liquid HD and G-agents and, to a lesser extent, V-agents.

Packet #2. A calcium hypochlorite; good for decontaminating HD and G-agents, but not as effective against V-agents.

Packet #3. A high-purity potassium permanganate, known to be effective against fungus, poison ivy and other materials which affect the skin. Not effective against CW agents.

Packet #4. Powdered soap, similar to a detergent. Soap and water are standard for physically removing CW agents.

Packet #5. Carbonate natri is not sodium carbonate, but was found to have a high content of sodium sulfate with chromium impurities. Sodium sulfate would not be particularly effective for the use described.

Packet #6. A high-purity copper sulfate, partially hydrated. This is a standard material and is effective for control of white phosphorus.

Packet #7. A cellulose material similar to cotton, which is a standard material for removing contaminants and applying decontaminants.

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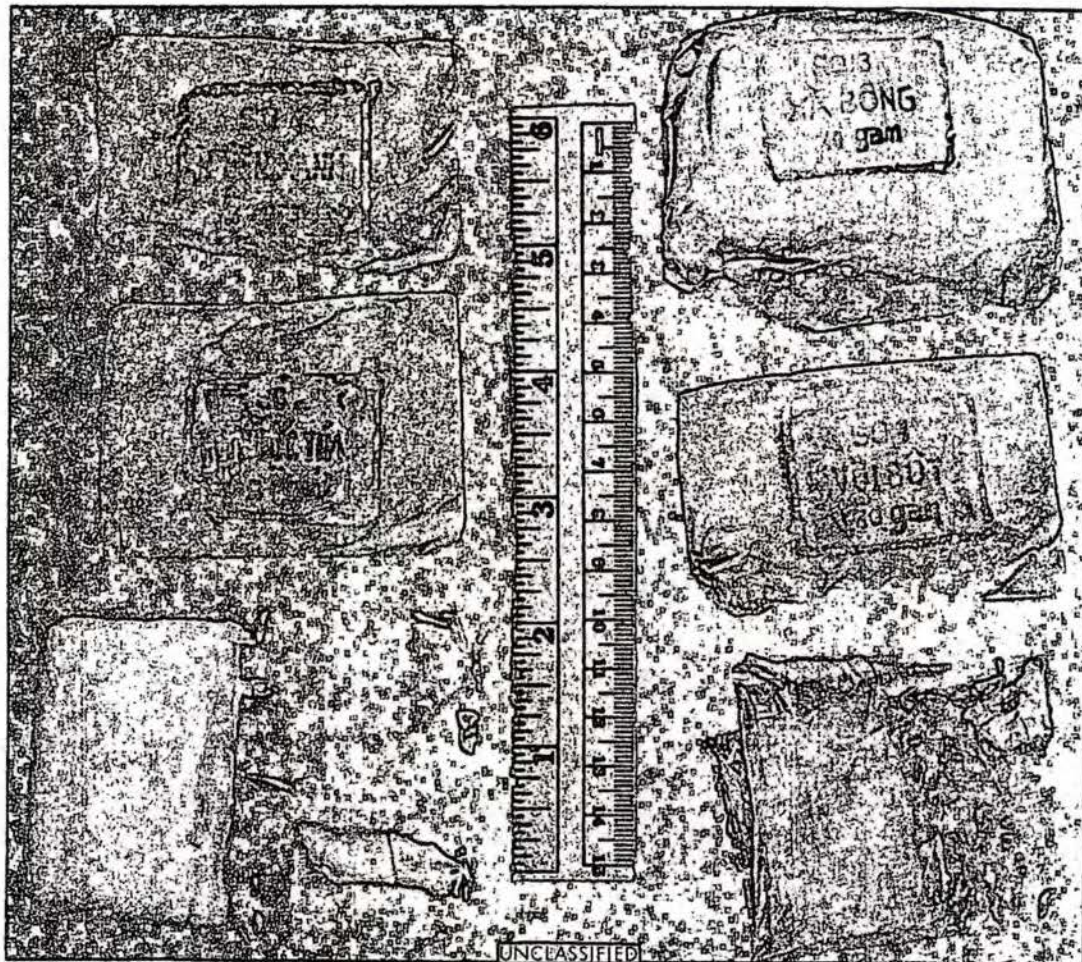
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FSTC-CS-03-04-67

NOMENCLATURE: Self-Treatment Kit Containing Five Packets



(U)

(C) The kit is comprised of four paper-wrapped packets, a plastic envelope containing cotton, and an instruction sheet (see illustration). The construction and the contents of the four paper packets are essentially the same as the first four items of the seven-packet kit previously described. The instruction sheet is believed to include instructions essentially similar to those given for items of corresponding materials in the seven-packet kit. Translations of printing on the packets show their contents to be:

- Packet #1. Powdered lime.
- Packet #2. Permanganate.
- Packet #3. Soap.
- Packet #4. Copper sulfate.
- Packet #5. Cotton (unlabeled).

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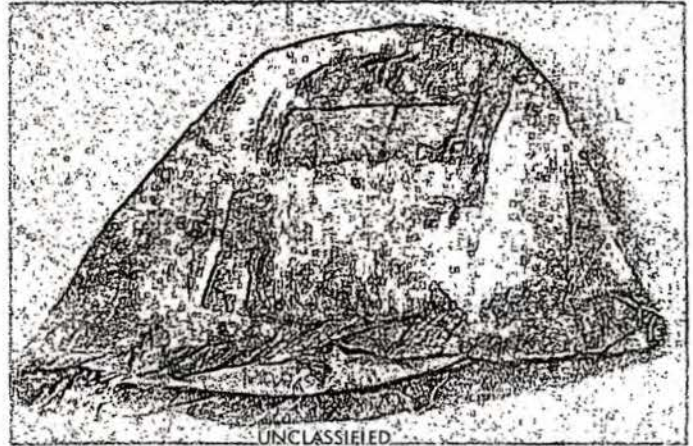
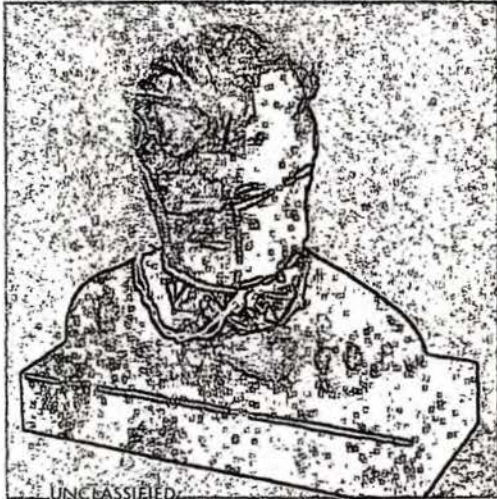
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FSTC-CS-03-04-67

NOMENCLATURE: Protective Masks (Improvised Types)



(U)

(C) Several styles of improvised protective masks have been captured in South Vietnam. One style is hardly more than a cloth pad equipped with cords which tie around the head to hold the pad over the nose and mouth. Other styles, which cover the entire head, are bag shaped and have eyeholes covered by some transparent material. Breathing apertures, incorporated at the nose position in most styles, are covered by several layers of cloth which may contain charcoal granules. Laboratory tests made on the captured masks showed that they provided protection against agent CS for no longer than 26 seconds. The test results concluded that "The improvised masks provide limited protection against tear gas (CS), but, using proper techniques, could be employed to withstand a moderate or short-term CS attack." Masks of these types would provide virtually no protection against the more damaging or lethal types of CW agents such as mustard, phosgene, hydrogen cyanide, or G- or V-type nerve agents.

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