NOT MEASUREMENT SENSITIVE

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28 September 1990
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16 July 1979

MILITARY STANDARD

PROTECTIVE COMPOUNDS (FOR PERSONNEL)

AMSC N/A

FSC 6850

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DEPARTMENT OF DEFENSE
Washington, DC 20301

Protective Compounds (For Personnel)

MIL-STD-1221B

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Chemical Research, Development and Engineering Center, Attn: SMCCR-PET-S, Aberdeen Proving Ground, MD 21010, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FOREWORD

This book format standard on protective compounds (for personnel) is approved for use by all departments and agencies of the Department of Defense in the selection of items for application. It is intended to prevent the entry of unnecessary items (sizes, types, varieties) into the Department of Defense logistics system. This is not a procurement document.

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LIST OF TABLES

1. SCOPE

1.1 Scope. This standard is a presentation of nomenclature, symbols, physical and chemical properties and requirements, military and typical commercial uses, directions for use, packaging data, labeling, general safety precautions, storage information, disposal data, toxicity data and shelf life of all military standard protective compounds (for personnel). This standard does not necessarily include all classifications of the items represented by the title or those which are commercially available. It does contain items preferred for use in the selection of corrosion protective compounds (for personnel) for application by the Department of Defense.

1.2 Application. Items listed herein accommodate essential requirements of the military and defense agencies, and will effect continued economies in all logistics functions when properly employed in new applications.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

O-D-1271	Diethylenetriamine, Technical
O-E-780	Ethylene Glycol Monomethyl Ether, Technical
O-T-236	Tetrachloroethylene (Perchloroethylene) Technical Grade
PPP-C-2020	Chemicals, Liquid, Dry, and Paste, Packaging of

MILITARY

MIL-C-7907	Cleaning Compound, Decontaminating (For Soiled and Radioactive Contaminated Surfaces)
MIL-C-12468	Decontaminating Agent, STB
MIL-C-15203	Coating Compound, Bituminous, Emulsion Type, Coal Tar Base
MIL-D-50030	Decontaminating Agent DS2
MIL-P-51529	Packaging of Decontaminating Agent DS2, in 1-¼ Quart Can and 5 Gallon Pail
MIL-A-51027	Antisetting Compound, Decontamination Slurry, M2

STANDARDS

FEDERAL

FED-STD-313	Material Safety Data Sheets, Preparation and the Submission of

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

CODE OF FEDERAL REGULATIONS (CFR)

Title 29	Department of Labor, Occupational Safety and Health Administration
Title 40	Protection of the Environment; Environmental Protection Agency
Title 49	Department of Transportation; Hazardous Materials Regulations
Title 94	Resource Conservation and Recovery Act, Public Law 94-580

DEPARTMENT OF DEFENSE (DOD)

DODISS	Department of Defense Index of Specifications and Standards
DOD 4145.19-R-1	Storage and Materials Handling
DOD 4160.21-M	Defense Utilization and Disposal Manual
DOD 6050.5	DOD Hazardous Materials Information System, Hazardous Item Listing
TB MED 502 (DLAM 1000.2)	Occupational and Environmental Health Respiratory Protection Program
TB MED 506	Occupational and Environmental Health Occupational Vision
TM 38-250	Packaging, Materials Handling - Preparation of Hazardous Materials for Military Air Shipment

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

Registry of Toxic Effects of Chemical Substances
Recommendation for Environmental Exposure Limits

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS (Not Applicable)

4. GENERAL REQUIREMENTS

4.1 Packaging data and labeling. All chemicals included in this standard shall be packaged in accordance with Federal Specification PPP-C-2020 and all applicable documents referenced therein. Shipping containers shall be labeled in accordance with current Department of Transportation (DOT) Hazardous Materials Regulations applicable to each chemical. When shipping by military aircraft the requirements of TM 38-250 shall apply. In addition, each item shall be packaged and labeled as specified in the applicable contract or order. All labels shall also comply with Hazard Communication Standard, 29 CFR 1910.1200(f).

4.2 Hazardous materials information. DOD 6050.5, DOD Hazardous Materials Information System (HMIS) acquires, reviews, stores, and disseminates Material Safety Data Sheet (MSDS) information for all hazardous materials used by DOD. The contractual acquisition of a MSDS is accomplished through use of Federal Acquisition Regulation, paragraph 52.223-3, Hazardous Material Identification and Material Safety Data. The MSDS is prepared in accordance with the instructions of FED-STD-313; and shall comply with requirements of Hazard Communication Standard, 29 CFR 1910.1200(g).

4.3 Safety.

4.3.1 Personal protective measures. The necessary respiratory, eye and skin protection to be used when handling chemicals shall be prescribed by the responsible installation industrial hygiene, medical and safety authorities.

4.3.1.1 Respiratory protection. Respirators, approved by the National Institute for Occupational Safety and Health (NIOSH) or the Mine Safety and Health Administration (MSHA) for the compounds being used, may be employed for intermittent exposure or for supplementing other control measures (refer to TB MED 502 or DLAM 1000.2). Ventilation shall be adequate to remove hazardous concentrations.

4.3.1.2 Skin protection. Personnel using these compounds shall be provided with and required to use impervious gloves, sleeves, aprons, and boots whenever indicated. Protective creams and ointments commonly known as "barrier creams" may be of value in certain cases. However, barrier creams shall not be used to replace protective clothing. In case of contact with the skin, wash affected areas thoroughly with water. Eye lavages and emergency showers shall be located within 50 feet of where there is a potential for direct contact with harmful chemicals. When transferring chemicals, eye lavages and emergency showers shall be within 50 feet of the transfer point. Emergency showers shall be equipped with a valve that will fully open with one pull and deliver 30 gallons of water per minute.

4.3.1.3 Face and eye protection. Personnel using these compounds shall be provided with and required to wear chemical splash-proof safety goggles. In addition, face shields shall be provided and worn over the goggles if splashing could occur. In case of contact with the eyes, immediately irrigate with copious amounts of water for at least 20-30 minutes, and obtain medical attention. (Refer to TB MED 506.)

4.3.1.4 Training. Employers shall provide employees with training and information including MSDS on all chemical items in their work area, in accor-

dance with 29 CFR 1910.1200(h), to ensure that employees know potential hazards of the chemicals with which they come in contact and the symptoms of exposure as well as how these chemicals affect the body and bodily functions. Employees shall be adequately trained to render first aid.

4.3.1.5 Exercise. Participation in exercises shall be stressed to demonstrate skills in the use of personal protective equipment and emergency response equipment.

4.3.2 Storage conditions. DOD 4145.19-R-1 describes general storage practices and requirements for hazardous materials in the DOD supply system. Specific requirements provided in the following paragraphs are supplementary in nature and shall be observed in consonance with the DOD storage regulations.

4.3.2.1 Flammable, combustible, pyrophoric and ignitable materials. A flammable material is generally any solid, liquid, vapor or gas that ignites easily and burns rapidly. Combustible materials are generally those that are difficult to ignite and burn slowly. The DOT, in Part 173, Subpart D, Section 173.115 of 49 CFR, defines a flammable liquid as one having a closed cup flash point below 100°F (37.8°C). A combustible liquid is defined, by DOT in the above reference, as one having a closed cup flash point at or above 100°F and below 200°F (93.3°C). A pyrophoric liquid is defined, by DOT in the above reference, as one that ignites spontaneously in dry or moist air at or below 130°F (54.4°C). Materials with flash points of 200°F or higher are not considered to be nonflammable or noncombustible, but are to be considered as burnable. The Environmental Protection Agency (EPA), in Part 261, Subpart C, Section 261.21 of 40 CFR (refers only to materials that have become waste materials), designates the criteria for flammable and combustible materials and oxidizers that exhibit the characteristic of ignitability (I). Liquids with closed cup flash points of less than 140°F (60°C) are defined by EPA as ignitable. The autoignition point (temperature) of a substance is generally defined as the minimum temperature required to initiate or cause self-sustained combustion in the absence of a spark or flame. Materials that ignite easily under normal industrial conditions are considered to be dangerous fire hazards. Such Materials shall be stored in a manner to prevent ignition and combustion. Easily ignitable substances, such as reducing agents, shall be kept away from strong oxidizing agents. All containers shall be tightly sealed. It is important to provide adequate ventilation in storage areas, and to locate the storage areas of these items away from fire hazards. Ample fire control equipment shall be easily accessible. Storage buildings, rooms and cabinets shall comply with provisions of the National Fire Codes. The building shall be electrically grounded and signs posted to prevent the lighting of matches or smoking in the area. Flammable storage areas shall be equipped with smoke or fire detection equipment.

4.3.2.2 Water-sensitive fire and explosive hazardous materials. These are materials that react on contact with water or steam to ignite or evolve heat or explosive gases. Such materials exhibit the characteristic of reactivity (R) as designated by the EPA in Section 261.23 of the above reference. (Refers only to materials that have become waste materials.) These materials shall be stored in well-ventilated, cool, dry areas. All containers shall be tightly sealed. These materials are a fire hazard in contact with water or moisture; therefore, it is essential that no sprinkler be used. Otherwise, the building shall conform to that required for storage of flammable materials. The building shall be waterproof, located on high ground, and separated from other storage areas.

4.3.2.3 Incompatible materials. Materials that are chemically incompatible shall be segregated in the storage of both serviceable and unserviceable items. The degree of segregation will depend upon DOD 4145.19-R-1 and local supplementary requirements that insure safe storage conditions. Hazardous storage compatibility codes are provided in the HMIS referred to in 4.2.

4.3.3 Chemical hazardous exposure limits. Chemical hazardous exposure limits for airborne concentrations of substances are obtained from the current TLVs® Threshold Limit Values for Chemical Substances in the Work Environment, adopted by the American Conference of Government Industrial Hygienists (ACGIH); current Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL), 29 CFR, Section 1910.1000; and NIOSH Recommendation for Environmental Exposure Limits. Such information is also shown in MSDSs and the HMIS referred to in 4.2. Carcinogenic substances are listed by OSHA in Category I for confirmed carcinogens, and in Category II for suspected carcinogens. Category I substances have standard exposure limits set at the lowest possible levels. Category II substances have standard exposure limits set to prevent acute or chronic effects.

4.3.4 Toxicity. Toxicity information for chemical compounds is available from various publications and from MSDSs, which are collected in DOD 6050.5 Hazardous Materials Information System.

4.3.4.1 EPA toxic (T). Some chemical compounds have been designated by the EPA as toxic (T) in accordance with the criteria shown in Part 261, Subpart B, Section 261.119(a)(3) of 40 CFR. (Refers only to materials that have become waste materials.) Some commercial chemical products are listed as toxic under Subpart D, Section 261.33(f).

4.3.4.2 EPA acute hazardous toxicity (H). Some chemical compounds have been designated by the EPA as acute hazardous (H) in toxicity in accordance with the criteria shown in Subpart B, Section 261.11(a)(2) of the above reference. (Refers only to materials that have become waste materials.) Some commercial chemical products are listed as acute hazardous in toxicity under Subpart D, Section 261.33(e).

4.4 Pollution and disposal.

4.4.1 Pollution potential. All items described in this standard shall be assumed to have a pollution potential. However, to minimize this potential, the proper use, storage and disposal methods shall be strictly followed.

4.4.2 Disposal of excess of unserviceable material. To minimize disposal problems, it is recommended that no more than a one year's supply of each item listed in this standard be stocked. Therefore, the unit of issue for hazardous chemicals should be small enough for activities to use up a container's content in a reasonable period of time. When stocks have been declared excess or unserviceable, they will be disposed of in accordance with the Defense Utilization and Disposal Manual, DOD 4160.21-M, and applicable DOD Policy Memoranda. Guidance can be obtained from your servicing Defense Reutilization and Marketing Office (DRMO) on procedures required for proper reporting and turn-in.

4.4.3 Disposal and storage of hazardous wastes. Items are classified and managed as hazardous wastes as defined by the Resource Conservation and Recovery

Act (RCRA) (Public Law 94-580). Items have been identified as meeting hazardous characteristics (i.e., ignitable, corrosive, reactive or toxicity) or are listed (i.e., toxic or acute hazardous) according to Identification and Listing of Hazardous Waste, Part 261; 40 CFR; or have been determined to be hazardous wastes by declaration of the Defense Reutilization and Marketing Service (DRMS) in accordance with procedures set forth in DOD 4160.21-M. Disposal of such items shall be managed in accordance with the Installation Environmental Office, the DRMO, or the Safety and Health Office to insure proper reporting of disposal and treatment actions to the US EPA and State; and shall be managed in accordance with Federal, State and local laws. The three main disposal methods are turn-in to the DRMO, on-post disposal by installation personnel, or disposal by commercial contract. Hazardous wastes that cannot be used, or disposed of as stated in 4.4.3.4.2, shall be stored under environmentally safe conditions until suitable methods of disposal are determined. Short-term storage (less than 90 days) requires proper containment (i.e., packaging and facilities) in accordance with Section 262.34, Part 262 of the above reference. Long-term storage (greater than 90 days) requires permission by the EPA or by the State under Public Law 94-580 (RCRA), in compliance with the requirements of 40 CFR Parts 264 and 265. Physical custody will be accomplished by the activity with conforming storage or most nearly conforming storage. When physical custody is in question, the Post Commander will make the final decision. In all cases where the wastes are to be collected, stored, transported and disposed of at a State or local permitted disposal facility, the identity and description of the waste shall be maintained and recorded in accordance with Part 262 of the above reference. Transportation of the waste shall be in accordance with Part 263 of the above reference, Standards Applicable to Transporters of Hazardous Waste.

4.4.3.1 Cleanup of liquid spills. To control the migration of spilled or leaking liquids, dike around the item with an inert, dry absorbent (e.g., clay, sawdust or vermiculite) or follow installations spill plans (Spill Prevention Control and Countermeasure Plan and Installations Spill Contingency Plan). Control entry to the spill site and segregate salvageable materials away from the spill area. Initiate waste cleanup operations immediately in accordance with local procedures. The residue shall be safely handled and transported to an approved or permitted disposal or storage facility. Packaging, labeling, transportation and record-keeping requirements for this waste material are determined by the appropriate Federal and State agencies and local procedures. It is recommended that all activities involving disposal preparation and transportation to commercial facilities be properly coordinated with the appropriate Federal and State agencies responsible for health and environmental aspects of hazardous materials. It is imperative that the proper description of waste accompany the packaged item at all times. Final disposal of the waste item shall be accomplished by reutilization, transfer, donation or sales by DRMS in accordance with DOD 4160.21-M or by ultimate disposal as described in 4.4.3.2. Spill residue, including contaminants, to be turned in to the DRMO shall first be properly identified, containerized, and labeled. For large scale spills that grossly contaminate the environment, the Chemical Transportation Emergency Center (CHEMTREC), can be called for assistance. Applicable procedures of the local spill control plan shall be followed. Necessary respiratory, eye, and skin protection measures are to be used while performing cleanup operations.

4.4.3.2 Ultimate disposal. Ultimate disposal shall be accomplished at a permitted or approved hazardous waste treatment or disposal facility designated by the Installation Environmental Office, DRMO, or Safety and Health Offices.

4.4.4 DISCLAIMER. RECOMMENDED DISPOSAL INSTRUCTIONS ARE FORMULATED FOR USE BY ELEMENTS OF THE DEPARTMENT OF DEFENSE. THE UNITED STATES OF AMERICA IN NO MANNER WHATSOEVER EITHER EXPLICITLY OR IMPLICITLY WARRANTS, STATES, OR INTENDS SAID INSTRUCTION, TO HAVE ANY APPLICATION, USE OR VIABILITY BY OR TO ANY PERSON OR PERSONS CONTRACTING OUTSIDE THE DEPARTMENT OF DEFENSE OR ANY PERSON OR PERSONS CONTRACTING WITH ANY INSTRUMENTALITY OF THE UNITED STATES OF AMERICA AND DISCLAIMS ALL LIABILITY FOR SUCH USE. ANY PERSON USING THESE INSTRUCTIONS WHO IS NOT A MILITARY OR CIVILIAN EMPLOYEE OF THE UNITED STATES OF AMERICA SHOULD SEEK COMPETENT PROFESSIONAL ADVICE TO VERIFY AND ASSUME RESPONSIBILITY FOR THE SUITABILITY OF THESE INSTRUCTIONS TO THEIR PARTICULAR SITUATION REGARDLESS OF SIMILARITY TO A CORRESPONDING DEPARTMENT OF DEFENSE OR OTHER GOVERNMENT SITUATION.

5. DETAILED REQUIREMENTS

5.1 Name. Antisetting Compound, Decontamination Slurry, M2

5.1.1 Specifications. MIL-A-51027, Antisetting Compound, Decontamination Slurry, M2.

5.1.2 Technical description. Antisetting compound, decontaminating slurry shall be a thoroughly blended mixture of citric acid, anhydrous, sodium tripolyphosphate and calcium oxide in the quantities shown in Table I. A minimum of 95% by weight will pass through a 4,760 micron (No. 4) sieve when tested as specified in MIL-A-51027.

TABLE I. Formulation of Antisetting Compound, Decontamination Slurry, M2

Ingredients	% By Wt.
Calcium oxide	3.0±0.2
Citric acid (anhydrous)	46.5±1.0
Sodium tripolyphosphate	50.5±1.0

5.1.3 Use. Antisetting compound agent is intended for military use in retarding settling and setting in decontaminating agent slurry mix. In cold weather, the M2 antiset prevents the slurry from settling and setting in the lines and tank.

5.1.4 Safety. When antiset material comes in contact with skin, wash it off with water for at least 15 minutes. For additional precautions, see 4.3.

5.1.5 Storage. Antiset material is a powder packaged in a polyethylene bag which is further contained in a fiber can. There are no temperature restrictions in the storage of this material. The containers must be kept dry or deterioration of the product may occur. When stored in this manner, the shelf life is indefinite.

5.1.6 Disposal. For appropriate procedures, contact the installation's Environmental Coordinator. (Refer to 4.4) Items requiring ultimate disposal should be transferred to an installation or municipality with a sewage treatment plant capable of phosphate removal.

5.2 Name. Decontaminating Agent

5.2.1 Specifications. MIL-C-7907, Cleaning Compound, Decontaminating.

5.2.2 Technical description. This compound is a formulation of ingredients, shown in Table II. Surface and interfacial tension is as shown in Table III. Soil removal, cleaning and rinseability is as shown in Table IV. The cleaning compound in distilled water is not to cause discoloration, corrosion, chemical attack or any other deterioration on aluminum alloy, copper, steel, magnesium and cadmium plated steel, except for a slight streaking of aluminum alloy sheet and alclad aluminum alloy sheet. It is soluble in water, hard water and sea water.

It causes no discoloration, corrosive chemical attack or other deterioration in decontaminating and cleaning, finished and unfinished aircraft surfaces.

TABLE II. Typical formulation of decontaminating agent.

Ingredient	% By Wt.
Non ionic detergent	10
Borax (sodium borate)	10
Carboxymethylcellulose	5
Sodium hexametaphosphate ($Na_6P_6O_{18}$ technical)	10
Sodium tripolyphosphate (anhydrous, $Na_5P_3O_{10}$ technical)	30
Sodium xylenesulfonate	5
Tetrasodium pyrophosphate (anhydrous)	10
Trisodium phosphate, tribasic (anhydrous)	20

TABLE III. Surface and interfacial tension of decontaminating agent.

Cleaning Compound Dissolved In	Requirements	
	Surface Tension	Interfacial Tension
	Max.	Max.
	dyn/cm	dyn/cm
Distilled water	34	4
Synthetic hardwater	32	4
Synthetic sea water	32	3

TABLE IV. Soil removal, cleaning and rinse ability.

	Requirement	
	Min.	Max.
Radioactive soil removal, percent	20	---
Cleaning ability	---	None
Rinsing ability	---	None[1/]

[1/] Slight film allowed after rinsing with synthetic hardwater.

5.2.3 Use. This compound is intended for military use in the general cleaning and decontaminating of metallic surfaces including aircraft, and is

primarily intended for use in solutions of water of any hardness, as well as sea water.

5.2.4 Safety. This material is not poisonous nor is it flammable. If the cleaning compound should come in contact with skin, wash it off with water for at least 15 minutes. For additional precautions, see 4.3.

5.2.5 Storage. This cleaning compound consists of finely ground powders that will remain stable and which are not subject to any abnormal change with age providing the sealed containers remain intact. Care must be observed to store this item in dry warehouses where protection from precipitation and other moisture is afforded.

5.2.6 Disposal. For appropriate disposal procedures, contact the installation's Environmental Coordinator (see 4.4). Items requiring ultimate disposal should be transferred to an installation or municipality with a sewage treatment plant capable of phosphate removal.

5.3 Name. Decontaminating Agent, STB

5.3.1 Specifications. MIL-D-12468, Decontaminating Agent, STB

5.3.2 Technical description. STB (supertropical bleach) decontaminating agent shall be prepared by mixing calcium oxide with bleaching powder (chlorinated lime). The bleaching powder shall have a maximum moisture content of 1.0 percent. Calcium hypochlorite (high test hypochlorite) shall not be used as a substitute for the bleaching powder.

TABLE V. Physical and chemical requirements of decontaminating agent, STB.

Property[1/]	Requirements	
	Min.	Max.
	% By Wt.	% By Wt.
Available chlorine	28.0	---
Calcium oxide	3.0	6.6
Iron as ferric oxide	---	0.2
Loss of available chlorine	---	4.0
Moisture	---	1.0
Particle size through No. 14 sieve	98.0	---
Particle size through No. 30 sieve	60.0	---

1/ Bulk density, minimum, 0.8 g/mL and bleach powder moisture content, maximum, 1.0% by wt.

5.3.3 Use. Decontaminating agent, STB is intended for military use in destroying or converting certain chemical warfare agents into harmless or less toxic compounds. It is a decontaminant for biological warfare agents. STB is

used in the dry state by spreading it over contaminated surface. More effective decontamination results when a slurry of 40 parts bleach and 60 parts water (by weight) is sprayed or swabbed on contaminated surfaces. When used in dry form, STB should be mixed with earth in the proportions of two parts of STB and three parts of earth, thoroughly mixed. When applied to liquid mustard gas, the reaction is so violent that the liquid mustard bursts into flames and the heat generated causes a high concentration of mustard vapor in the area.

5.3.4 Safety. Personnel working with decontaminating agent, STB should be adequately protected against the destructive effects of the material. This material is dangerous to both eyes and lungs. If it comes in contact with eyes or skin, wash with copious amounts of water and call a physician immediately. Do not allow this material to come in contact with acids, organic or easily burnable material. STB is not combustible but it evolves chlorine and at high temperatures, oxygen. For additional precautions, see 4.3.

5.3.5 Storage. STB is a powder which will cake when exposed to excessive moisture. It is not affected greatly by temperature variations provided the containers are properly sealed and the paint on the outside of the containers remains intact. STB should be stored where the greatest protection from moisture is afforded. However, if this material is stored under adverse climatic conditions surveillance shall be reduced to six months. Provided containers and closures are not broken or corroded, this material will remain in serviceable condition 10 or more years from the date of manufacture. DS2 and STB are incompatible and should never be stored together since DS2 is a strong reducing agent and STB is a strong oxidizing agent.

5.3.6 Disposal. For the appropriate disposal methods, contact the installation's Environmental Coordinator (see 4.4).

5.4 Name. Decontaminating agent, DS2
(Hazardous)

5.4.1 Specifications. MIL-D-50030, Decontaminating Agent, DS2.

5.4.2 Technical description. Decontaminating agent, DS2 is a homogeneous mixture of the materials specified in Table VI.

TABLE VI. Composition of DS2.

Material	Conforming To	Requirements	
		Min.	Max.
		% By Wt.	% By Wt.
Diethylenetriamine (specific gravity 0.950 g/cm^3)	O-D-1271	69.0	71.0
Sodium hydroxide, ACS grade except that sodium carbonate content shall be no greater than 0.5% by weight	----	1.90	2.10
Ethylene glycol monomethyl ether	O-E-780		Remainder

TABLE VII. Physical and chemical properties of decontaminating agent, DS2.

Form	Solution	
	Min.	Max.
Flash point (F)	168° (76°C)	---
Reactivity, mg of chloroform	350	---
Specific gravity (25/25°C) g/cm^3	0.970	0.980
Suspended matter	---	---
Before heating	---	0.15% by vol.
After heating	---	0.20% by vol.
Viscosity, cps at -30°C	---	420

5.4.3 Use. The material covered by this standard is intended for use as a decontaminating agent for rendering persistent chemical agents harmless. The material is packaged in either 1-⅛ quart cans or 5 gallon pails as specified in MIL-D-51529.

5.4.4 Safety. Decontaminating agent, DS2 is a caustic material. Avoid contact with skin and clothing. If contact should occur, blot off the area with a rag and flush with copious amounts of water for at least 15 minutes. Avoid inhaling the vapors. For additional precautions, see 4.3.

5.4.5 Storage. Store packages of decontaminating agent, DS2 in a protected warehouse where the packages are not subject to extreme heat or exposure to 168°F (76°C) and is a caustic liquid. Moisture will deteriorate the metal containers, so it is imperative that they be kept dry. Leaking or broken containers should be withdrawn when discovered. Store this product carefully to avoid damage to the containers. The shelf life is indefinite provided the containers and closures remain intact. DS2 and STB are incompatible and should never be stored together since DS2 is a strong reducing agent and STB is a strong oxidizing agent.

5.4.6 Disposal. For appropriate disposal procedures, contact the installation's Environmental Coordinator (see 4.4). If a DS2 spill or leak should occur, it should be handled like an oil spill. Open buring is prohibited. To preclude further contamination by the spilled or leaking liquids dike around the item with an inert dry absorbent (e.g. clay, sawdust or vermiculite). Segregate salvageable materials away from the spill area and initiate waste cleanup operations immediately. Cover the residue with dry absorbent and let stand until the liquid is completely absorbed and package all contaminated dry absorbent and contaminated containers in such a manner that the waste item can be safely handled and transported to an approved disposal site.

6. NOTES

6.1 Intended use. This standard is intended to cite nomenclature, formulas, physical and chemical properties, specification requirements, military uses, safety information, storage information, and disposal information for protective compounds containing decontamination agents preferred for use by the Department of Defense.

6.2 Subject term (key word) listing.

Antisetting compound, decontamination slurry, M2
Decontaminating agent
Decontaminating agent, DS2
Decontaminating agent, STB
Hazardous wastes, disposal and storage of
Information, hazardous chemicals
Safety, hazardous chemicals
Sodium hydroxide

6.3 Abbreviations. The use of abbreviations in this military standard are in accordance with MIL-STD-12 where applicable. Metric system abbreviations and symbols are in accordance with ASTM E 380.

6.4 Changes from previous issue. Asterisks or vertical lines are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

I N D E X

CONCLUDING MATERIAL

Lead Service Activity:

Defense General Supply Center - GS

Custodians:

Army - EA
Navy - YD
Air Force - 68

Preparing Activity:

Army - EA
Project Number 6850-1068

Review Activities:

Army - GL
Navy - MS, SH

User Activities:

Navy - MC

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-STD-1221B	PROTECTIVE COMPOUNDS (FOR PERSONNEL)

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 1426 PREVIOUS EDITION IS OBSOLETE

(FOLD ON THIS LINE, CUT ALONG THIS LINE.)

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