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DECONTAMINATION AND IMPREGNATION KIT, INDIVIDUAL

Army Test and Evaluation Command
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13 ABSTRACT

Describes a method for evaluation of individual decontamination and impregnation kit operational and functional performance characteristics. Identifies supporting tests, facilities, and equipment required. Provides procedures for operational suitability tests. Applicable to chemical agents. Excludes test against toxic agents.

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	ROLE	WT	ROLE	WT	ROLE	WT
CB Materiel						
Chemical Agent Detectors						
Decontamination Device						
Decontamination						
Impregnating Set						
Protective Gear						
CB Protective Equipment						

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U. S. ARMY TEST AND EVALUATION COMMAND
EXPANDED SERVICE TEST - SYSTEM TEST OPERATIONS PROCEDURES

AMSTE-RP-702-107
*Test Operations Procedure 8-3-137 21 December 1972

DECONTAMINATION AND IMPREGNATION KIT, INDIVIDUAL

SECTION I
GENERAL

1. Purpose and Scope.

a. This procedure applies to chemical agent decontamination and impregnation kits designed to be used by the individual soldier. It describes methods and techniques for use in the conduct of a development Test II (ST) to determine whether the test item meets the criteria established in appropriate requirements documents and is suitable for use by the U.S. Army.

b. These procedures address a preoperational inspection to determine the physical characteristics and serviceability of the test item, a series of appropriate tests designed to examine the functional performance of the test item, and an examination of the safety, human factors, and value engineering aspects of the test item.

c. This document provides for tests conducted in a realistic tactical environment to include simulated combat conditions. Testing

*This TOP supersedes MTP 8-3-137, 6 April 1971.

will be conducted using soldiers representative of those who will operate and maintain the test item in the field and under climatic and environmental conditions representative of those areas where the equipment will be used. Observations of the climatic conditions prevailing during the service test should be made to provide a record for future evaluations.

d. During all phases of testing, the test soldiers will be equipped with field uniforms, weapons, and equipment appropriate for the prevailing weather and the activities in which they are engaged. The test soldiers will be informed of the overall purpose of the test and the specific objectives of each test phase in which they will participate.

2. Background.

a. The individual decontamination and impregnation kit is provided as an emergency method of decontaminating the individual's skin, outer clothing, and equipment when they have been contaminated by a chemical agent. The kit is designed to enable the individual to take prompt action to protect himself if he is exposed to a surprise chemical attack or accident, or if equipment and supplies for large-scale decontamination are not immediately available. It is also used to reimpregnate the CB protective clothing. The kit will usually be issued as an accessory to the field protective mask.

b. The present standard item is the ABC-M13 Individual Decontaminating and Reimpregnating Kit. This kit is contained in a plastic can that is carried in the protective mask carrier. It is an expendable item, requiring no maintenance. The kit consists of:

(1) A small cloth bag filled with "fuller's earth" powder, used to absorb chemical agents from skin.

(2) Two cloth bags filled with a decontaminating and reimpregnating compound (XXCC3), used to detect chemical contamination. Each bag contains a capsule of chemical agent detector dye. When the dye capsule inside the bag is crushed and kneaded into the compound and the bag is subsequently rubbed over clothing and equipment, the presence of contamination is disclosed by color changes of the contaminated spot.

(3) A single-edge cutter used to cut out spots of hazardous contamination on clothing.

c. As the kit is improved, or the components changed, service testing of the new item will be required to determine whether it meets the established criteria and is suitable for use by the U.S. Army.

3. Equipment and Facilities.

a. Equipment.

(1) Test items.

(2) Control items, if applicable.

(3) Safety and first aid equipment.

(4) Photographic equipment, still and motion.

(5) Communications equipment.

(6) Linear and weight measurement tools.

(7) Meteorological equipment.

(8) Tactical vehicles, ground and air.

(9) Stopwatches.

(10) Individual CB clothing and equipment.

(11) Salvage fatigue uniforms.

(12) Chemical agent simulants.

(13) Mixing barrel, pails, and stirring rods.

(14) Parachutes and related equipment.

(15) Administrative materials (data forms, rating questionnaires, pencils, marking pens, etc.).

b. Facilities.

(1) Field training areas.

(2) Classrooms, storage area, and office space.

SECTION II
TEST PROCEDURES

4. Supporting Tests.

a. The procedures outlined in this TOP provide general guidance for the conduct of expanded service tests. Detailed specific procedures are dependent on the characteristics of the item being tested and the stated criteria in applicable requirements documents.

b. In preparing for the test, the test officer should conduct the necessary administrative, personnel, and supply actions outlined in the test officer's guide or manual, or in the unit standing operating procedures (SOP). Sufficient pretest training must be accomplished to ensure test soldiers are equally familiar with the test and control items. The performance of the test item should not be degraded because it is new, or because the test troops are unfamiliar with it.

c. During each subtest, sufficient data should be collected to support valid conclusions. This goal may be constrained by limitations on the number of test items, time available for testing, manpower and funds available, or support and control equipment available. When planning the test, the test officer should consult with methodology personnel (e.g., statistical analysts, experimental psychologists, human factors analysts) for assistance in selecting the best techniques for collecting meaningful and sufficient data to permit a statistically valid evaluation of the test item. Methodology personnel can advise and assist the test officer in determining the appropriate experimental design to include the techniques for random sampling, the sample size required to evaluate the true performance, how to estimate average performance (or variability of performance) from a sample, how to compare materials or products with respect to average performance (or variability of performance), the number of test soldiers needed, and the number of repetitions required for a specific exercise. Additional statistical guidance may be found in TOP 3-1-002, Confidence Intervals and Sample Size, and in National Bureau of Standards Handbook 91, Experimental Statistics.

d. Common Service TOPs, the test defined in Section III, and other published documents to be considered in formulating an expanded service test plan are listed below. Additional reference material is in the appendix.

	TEST SUBJECT TITLE	PUBLICATION NO.
(1)	Preoperational Inspection, and Physical Characteristics	8-3-500
(2)	Safety	8-3-506
(3)	Personnel Training	10-3-501
(4)	Operational Suitability (refer to para 5)	
(5)	Desert Environmental Test of General Supplies and Equipment	10-4-001
(6)	Tropic Environmental Test of General Supplies and Equipment	10-4-003
(7)	Durability and Reliability	8-3-503
(8)	Maintainability	8-3-507 and TECR 750-15
(9)	Man Portability	10-3-506
(10)	Airdrop Operations	7-3-511 and 7-3-512
(11)	Adverse Conditions	3-3-524
(12)	Human Factors Engineering	8-3-509
(13)	Value Analysis	TECR 700-1

SECTION III
SUPPLEMENTARY INSTRUCTIONS

5. Operational Suitability.

a. Objective.

(1) To determine whether the test item can be easily carried and used by test soldiers.

(2) To determine whether the test item meets the criteria in the requirements documents pertaining to operational characteristics.

b. Method.

NOTE. The capability of the test item to detect the presence of toxic agents on the individual soldier's skin, clothing, and equipment; to neutralize the effects of the agents; and to reimpregnate protective clothing will be determined from the results of engineering and laboratory tests (see TOP 8-2-063, Decontaminating Kits, Individual, Field). Toxic chemical agents are not normally used during service testing, and the procedures herein apply to testing conducted without the use of toxic agents. However, realism will be gained through the use of simulants, such as molasses residuum (MR), motor oil, or similar viscous materials.

(1) Test soldiers, equipped with fighting and existence loads and wearing CB protective equipment as appropriate, will employ the test item in tactical exercises conducted under simulated combat conditions. The tactical exercises will be designed to ensure all test item operational characteristics described in requirements documents are fully demonstrated. During performance of the test exercises, the functional operation of the test item will be observed and evaluated in comparison with the control item being operated at the same time and under the same conditions. The exercises should resemble as closely as possible those situations which the intended users of the test item can reasonably expect to encounter in the performance of their combat missions. Field Manual 21-48, Chemical, Biological and Radiological (CBR) and Nuclear Defense Training Exercises, should be used as a guide in planning and conducting the test exercises.

(2) The test site will be selected to provide a realistic tactical environment and large enough to ensure the effects of any training agents used in testing do not interfere with unrelated activities outside the test area.

(3) Simulated contamination will be applied to the clothing, equipment, and exposed skin areas of the test soldiers, as authorized by the Safety Release. The test soldiers will then use the test item, in the manner indicated in applicable requirements documents and in instructions accompanying the test item, to identify the contaminated areas and reimpregnate the applicable portions of clothing.

(4) Repetitions of the test exercises will be conducted during daylight, darkness, and blackout conditions, and during inclement

weather that occurs during the test period, in order to evaluate the comparative effects of adverse conditions.

(5) Meteorological data (temperature, humidity, barometric pressure, precipitation, wind speed and direction) and light conditions (daylight or darkness) will be recorded during the test exercises.

c. Data Required.

(1) Description of the test site.

(2) Description of test exercise conducted.

(3) Description of items to which simulated contamination was applied.

(4) Description of simulant or training agent used.

(5) Description of the effectiveness of operating instruction and methods required to use the test item.

(6) Description of any difficulties encountered by test soldiers in using the test item.

(7) Description of any incompatibility between the test item and standard items of clothing and equipment, especially any CB protective items.

(8) Description of any difficulties in identifying the test item and its components under daylight, darkness, and blackout conditions.

d. Analytical Plan.

The test data should be analyzed subjectively to determine if the test item can be easily carried and used by the test soldiers and whether the criteria in the requirements documents pertaining to operational characteristics have been met.

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APPENDIX
REFERENCES

1. AR 70-10, Test and Evaluation During Development & Acquisition of Materiel.

2. AR 70-38, Research, Development, Test and Evaluation of Materiel for Extreme Climatic Conditions.

3. FM 21-40, Chemical, Biological, Radiological, and Nuclear Defense.

4. FM 21-41, Soldiers Handbook for Defense Against Chemical and Biological Operations and Nuclear Warfare.

5. FM 21-48, Chemical, Biological, Radiological (CBR) and Nuclear Defense Training Exercises.

6. TM 10-277, Protective Clothing, Chemical Operations.

7. National Bureau of Standards Handbook 91, Experimental Statistics.

8. TECR 70-23, Equipment Performance Reports.

9. TECR 70-24, Documenting Test Plans and Reports.

10. TECR 385-6, Verification of Safety of Materiel During Testing.

11. TECR 700-1, Quality Assurance; Value Engineering.

12. TECR 750-15, Maintenance Evaluation During Testing.

13. TOP 1-1-012, Classification of Deficiencies and Shortcomings.

14. TOP 1-1-045, General Supplies and Equipment Training.

15. TOP 1-1-046, Field Combat Test Exercises.

16. TOP 3-1-002, Confidence Intervals and Sample Size.

17. TOP 8-2-063, Decontaminating Kits, Individual, Field.