

FAMILIARIZATION BOOKLET

PROTECTIVE MASKS AND CHEMICAL AGENT DETECTOR KIT

INTRODUCTION

The purpose of this familiarization booklet is to acquaint government and auxiliary personnel, who have civil defense emergency assignments, with the use and care of protective masks, CD V-800 and CD V-860, and the Chemical Agent Detector Kit, CD V-810.

Information for Instructors:

The instructor should review all available material. He should read the Office of Civil and Defense Mobilization publications TB 11-25, "Introduction to Chemical Warfare"; TB 11-33, "Protective Mask, CD V-800"; and TB 11-29, "Chemical Agent Detector Kit, CD V-810." If available, he should also read the Department of the Army Technical Manual, TM 3-205, "Protective Masks and Accessories."

This booklet is designed only as a familiarization aid. No attempt has been made to present material beyond that contained in TB 11-25, TB 11-29, and TB 11-33.

BOOKLET: Protective Masks and Chemical Agent Detector Kit.

REFERENCE MATERIALS:

- TB 11-25 Introduction to Chemical Warfare
- TB 11-29 Chemical Agent Detector Kit, CD V-810
- TB 11-33 Protective Mask, CD V-800

PURPOSE:

To familiarize government personnel and auxiliaries, who have a civil defense assignment, with the purpose, use, and care of:

- 1. Protective Mask, CD V-800
- 2. Chemical Agent Detector Kit, CD V-810
- 3. Protective Mask, CD V-860

MAIN TOPIC	KEY POINTS
A. Introduction to Chemical Warfare	<ul style="list-style-type: none">1. Development of unconventional warfare.<ul style="list-style-type: none">a. Pitch pots in defense of Troy 1200 BC.b. "Greek" fire - seventh century BC.c. Flame throwers - eighteenth century by the Prussian Army.d. Recommended use of chlorine in artillery shells during Civil War.2. The Hague Declaration of 1899.3. Use of chlorine gas by Germans in 1915.
Development of War Gases	<ul style="list-style-type: none">4. Various chemical agents were developed after the initial use of gas by the Germans. Among these agents were:<ul style="list-style-type: none">a. Phosgene or carbonyl chloride.

- b. Lewisite.
 - c. Mustard gas.
 - d. Nitrogen mustards.
 - e. Nerve gases (or "G" agents).
- Opposition to Use of War Gases
- 5. 1921 Conference on Limitations of Armament recommending:
 - a. Outlawing of toxic chemicals in war.
 - b. Prohibition to be accepted as international law.
 - 6. France did not ratify the treaty, so it did not become binding.
 - 7. 1925 Geneva Conference condemning use of toxic agents and use of bacteriological methods of warfare.
 - 8. Protocol was never ratified by U. S. Senate.
 - 9. There is no international agreement prohibiting the use of chemical agents.
 - 10. Our government is taking measures for chemical warfare defense.
 - 11. Modern tactical developments make these measures of great importance to those having government-in-emergency responsibilities and our total civilian population.
- B. Protective Masks,
CD V-800 and
CD V-860
- NOTE: The following covers both Organizational Protective Masks, CD V-800 and CD V-860.
- 1. These protective masks are designed for personnel trained to carry out emergency actions in the event of enemy attack.
 - 2. Both masks protect the face, eyes, and respiratory tract from chemical and biological agents employed in war.

Nomenclature

3. Both offer protection from radioactive particles.
4. Neither will protect against toxic industrial gases, ammonia, carbon monoxide, or external nuclear radiation.
5. The complete unit includes three major components:
 - a. Facepiece assembly.
 - b. Canister.
 - c. Carrier.

NOTE: Both masks are similar with the exception of the hose from the facepiece to the canister on the CD V-860 and location of the air inlet. Consequently, nomenclature for both masks can easily be given at the same time. It is suggested that all following items of discussion be demonstrated by using the masks, with student participation.

Facepiece
Assembly

6. The facepiece assembly consists of the following:
 - a. A facepiece with a sealed single eyepiece (CD V-860 has two eyepieces) which offers a wide field of vision.
 - b. A deflector, inside at chin position, to prevent fogging of the eyepiece.
 - c. An outlet valve.
 - (1) CD V-800 at left cheek position.
 - (2) CD V-860 at nosepiece.
 - d. A canister attached to nosepiece of facepiece. (CD V-860 has hose from facepiece to canister.)
 - e. Head harness.

- f. Tab assemblies holding head harness to facepiece.
 - 7. The outlet, or check valve, in the facepiece permits air to flow out of the mask and prevents contaminated air from entering.
 - 8. Purified air enters the mask from the canister.
- Canister
- 9. The canister contains a filter designed to remove solid and liquid particles from incoming air. It provides complete protection from the inhalation of chemical, biological, and radiological agents.
 - 10. Its useful life varies with:
 - a. Type and amount of warfare agents in the air.
 - b. Length of exposure to contaminated air.
 - c. Breathing rate of wearer.
 - d. Temperature and humidity.
 - 11. If there is any damage to the canister that will affect its usefulness, another mask should be used.
- Carrier
- 12. The carrier is made of water-repellant cotton duck.
 - 13. It has an adjustable shoulder strap.
 - 14. The carrier holds the mask, canister, and the following additional items:
 - a. Antidim cloth.
 - b. Atropine (when issued).
 - c. Protective ointment (when issued).

15. The antidim cloth is used to wax the inside of the eyepiece to prevent fogging at low temperatures.
- C. Fitting the Mask
- NOTE: Demonstrate fitting the mask, with student participation.
- General
1. Proper fitting of the mask is essential for protection.
 2. Proper fitting:
 - a. Allows good circulation.
 - b. Provides wide field of vision.
 - c. Lessens the probability of headache.
 3. Proper adjustment of head harness straps can usually provide a snug, leakproof fit.
 4. Too tight adjustment strains the facepiece and creates leaks.
 5. If too great an adjustment is needed, another size mask should be tried.
- Detailed Fitting Procedure
6. The detailed fitting procedure is as follows:
 - a. Remove mask from carrier.
 - b. Loosen head harness.
 - c. Fit mask to face.
 - d. Center the head harness triangle well down on back of head.
 - e. Tighten each of the forehead straps by a rapid jerk.
 - f. Tighten each of the cheek straps.
 - g. Adjust temple straps.
 - h. Pull mask slightly away from face. The mask should settle back in a tight but comfortable fit.

- i. The mask should not press painfully on the nose, cut into the throat, nor overlap the ears.
- j. The top of the mask should come well up on the forehead, and the side edge should come to within about one inch of the ears.
- k. If slight gaps or channels are present in the facepiece, adjust the head harness.

D. Leakage

1. Test for leakage as follows:
 - a. Place the palm of the hand over the air inlet of the canister, inhale normally, and hold breath for 10 seconds.
 - b. If the facepiece tends to collapse, this indicates an effective air seal.
2. If leakage is indicated, visual inspection should be made as follows:
 - a. Inspect for bulging at edge of mask.
 - b. Feel for incoming air at edge of mask.
 - c. Observe breaks in the red mark left on face by edge of mask.
3. Air flow under the edge of the mask may be corrected by proper adjustment of the appropriate head harness straps. (See paragraph C 4, "a" through "d," TB 11-33.)
4. Air leakage may be caused by a faulty outlet valve disk.
5. To check:
 - a. Exhale rapidly several times.
 - b. Press on rubber cover of disk or probe gently with a matchstick.

E. Care of Mask

6. Replace mask with defective valves.
7. Examine facepiece for breaks, holes, or splits. These defects should not be patched; the mask should be replaced.
1. With reasonable care and attention, the mask should have a long life. Do not:
 - a. Handle the mask roughly.
 - b. Expose to extreme heat or cold.
 - c. Let water enter the canister.
 - d. Let mildew attack the fabric.
 - e. Overexpose the facepiece to extremes of heat, light, or contact with organic solvents.

Cleaning

2. Clean the mask every 6 months by following this procedure:
 - a. Remove mask from carrier and disconnect canister on CD V-800. (Do not disconnect canister on CD V-860.)
 - b. Wash facepiece with soap and water.
 - c. Rinse facepiece and dry in air at room temperature.
 - d. Attach canister.
 - e. Be careful to keep water out of canister; brush to remove superficial dirt.

F. Decontamination

1. It is not practical to decontaminate the mask during emergency operations.
2. The facepiece can withstand exposure to blister or nerve gases for at least 8 hours.
3. Decontamination procedures for blister and nerve gases differ.

MAIN TOPIC

KEY POINTS

Blister Gas
Decontamination

4. Protective ointment, CD V-820, is effective if applied to a mask within 5 minutes after its exposure to blister gas. Proceed as follows:
 - a. Blot drops of liquid gas from mask.
 - b. Apply ointment to all parts (inside and outside) of mask and carrier.
 - c. Use cloth to remove ointment 15 minutes after application.
 - d. Wash eyepieces with soap and water, polish and treat with antidiem.
 - e. Bury cloth used to blot liquid gases or to remove protective ointment.
 - f. Air mask in sun and wind at every opportunity.
 - g. Moderate contamination may be removed by soaking mask in hot, soapy water for 3 hours: wash, rinse, and dry. (Do not wash the canister.)
 - h. If heavily contaminated, place in hot, soapy water for 6 to 8 hours.

Nerve Gas
Decontamination

5. Masks that are lightly contaminated by nerve gas vapor may be decontaminated by airing or by washing with hot, soapy water.
6. After decontamination, dry mask in air for 24 hours.
7. If canisters are contaminated, treat exterior with bleach slurry or dilute water solution of lye or soda ash.
8. If liquid nerve gas enters the air inlet of a canister, the complete unit, mask and accessories, must be replaced.
9. If there is heavy contamination, replace the entire assembly.

MAIN TOPICS**KEY POINTS**

**G. Chemical Agent
Detector Kit
CD V-810**

1. The kit is used to detect dangerous concentrations of nerve, mustard, and nitrogen mustard gases in air (inside or outside).
2. It is designed for use by:
 - a. Chemical warfare defense personnel.
 - b. Personnel of health protection services.
 - c. Other trained workers.
3. Kit can be carried on user's belt.
4. The kit contains:
 - a. Rubber aspirator bulb.
 - b. Detector tube dispenser containing 50 blue dot detector tubes.
 - c. A green top dropper bottle for nerve gas test solution.
 - d. A blue top dropper bottle for mustard gas test solution.
 - e. Supply of solid reagents for making solutions.
 - f. Set of instructions.
5. Tests with the kit may indicate when it is safe to remove protective mask, whether gas is present in suspected areas and after decontamination.
6. When using kit, first test for nerve gases and then for mustard.
7. If any test is positive, keep protective mask on.
8. If tests are negative, open mask slightly, sniff cautiously.

9. If any watering of eyes, coughing or sneezing occurs, or any unusual odors are noticed, keep mask on.
- H. Procedures for Using Kit
1. Preparing solution - green bottle:
 - a. Prepare fresh solution each day kit is in use.
 - b. Place powder from one plastic packet, and one tablet from green vial into clean green bottle.
 - c. Add clear water until bottle is half full, and shake until no solid settles to bottom of bottle.
 - d. Fill bottle to shoulder with more water, and mix by shaking.
 - e. Wash bottle out at end of day.
 2. Preparing solution - blue bottle:
 - a. Add clear water to blue bottle until half full, add chemical and shake until chemical dissolves.
 - b. Fill bottle to shoulder with more water, and mix by shaking.
 - c. Solution may be used an indefinite period of time.
 - d. To replenish solution, empty contents of blue vial into clean blue bottle and dissolve in water as above.
- Sampling Bulb
3. Procedures are:
 - a. Remove bulb from kit.
 - b. Adjust lanyard loop over wrist.
 - c. Check bulb for leakage.
 - d. If leakage is found, a drop of oil or soapy water applied to valve may help seat valve ball.

Use of Tubes

e. Inspect bulb for cracks.

4. Procedures are:

- a. Use a separate tube for each test.
- b. Remove tube from dispenser.
- c. Snap off both ends of tube.
- d. Insert dotted end into bulb.

Sampling (where)

5. Downwind, about one foot from ground.

6. If testing surface contamination by liquid or solid agent:

- a. Place can or box over portion of area to be tested for 5 minutes.
- b. Punch hole in can or box and insert tube through hole.
- c. Do not allow tube to touch liquid.

Sampling (how)

7. Sampling procedures are:

- a. Deflate bulb completely.
- b. Allow bulb to inflate fully.
- c. Repeat 50 times for each nerve gas test and 12 times for each mustard gas test.

Test for
Nerve Gases

8. To test for nerve gases:

- a. Place new tube in bulb.
- b. Compress and release bulb 50 times.
- c. Add 1 drop of liquid from green bottle to undotted end of tube until grains are wetted.
- d. If yellow band appears, keep mask on.

MAIN TOPIC

KEY POINTS

Test for
Mustard Gases

9. To test for mustard gases:
 - a. Place new tube in bulb.
 - b. Compress and release 12 times.
 - c. Let stand 2 minutes if temperature is 65 degrees F. or above. If below 65 degrees F., warm in hand for 2 minutes.
 - d. Add 1 drop liquid from blue bottle to undotted end of tube until wetted.
 - e. If purple-blue band appears, keep mask on.

Precautions if
Nerve Gases Are
Present

10. When a negative test for nerve gas is obtained, and no new attack occurs, a person is safe without a mask for at least 20 minutes.
11. For longer safe periods, a negative test must be obtained with compressions indicated as follows:

<u>Bulb Compressions</u>	<u>Safe Time Without Mask</u>
50	20 minutes
100	40 minutes
150	1 hour
300	2 hours

Precautions if
Mustard Gas Is
Present

12. When a negative test for mustard gas is obtained, a person is safe without a mask for at least 30 minutes.
13. For longer safe periods, a negative test must be obtained with compressions indicated as follows:

<u>Bulb Compressions</u>	<u>Safe Time Without Mask</u>
12	½ hour
25	1 hour
50	2 hours
75	3 hours

MAIN TOPIC

KEY POINTS

**General
Precautions**

14. Do not use detector tubes or contents of vials after discard date.
15. Store kit in cool place.
16. If dropper in either bottle breaks, tests can be made by dipping undotted end of tube into liquid, then removing and inverting the tube so liquid wets grains.
17. Mark date of solution preparation on green and blue bottle.

**I. Concluding
Briefing**

1. Summarize key points covered in briefing.