

TB-11-29

April 1957

Reprinted September 1960

A DIGEST OF TECHNICAL INFORMATION

CHEMICAL WARFARE DEFENSE SERIES - 4

## CHEMICAL AGENT DETECTOR KIT, CD V-810

This is the fourth in a series of technical bulletins on civil defense against chemical warfare agents. Later bulletins in this series describe protective measures against chemical warfare agents, and treatment of casualties.

This technical bulletin describes the Chemical Agent Detector Kit, CD V-810, which may be used to detect dangerous concentration of nerve, mustard, and nitrogen mustard gases. These war gases are described in the third in this series of technical bulletins, *Chemical Warfare Agents of Special Significance to Civil Defense*, TB-11-28. The kit will also permit the nerve gases to be distinguished from the mustard and nitrogen mustard gases.

These kits are designed for use by civil defense workers.

They were developed by the Army Chemical Corps for the U. S. Navy as Kit, Agent Detector, E-27 R4, adapted by the Office of Civil and Defense Mobilization, and assigned the civil defense number V-810, as listed in the ODCM *Federal Contributions Manual*, AM-25-1.

The kit can be carried on the user's belt as shown in figure 1. It is rectangular in shape (3½" wide by 4¾" high by 2" thick) and weighs 14 ounces fully packed. It opens from back to front so that the lid pulls forward. When open, the lid of the kit holds a 1½-ounce rubber aspirator bulb equipped with a

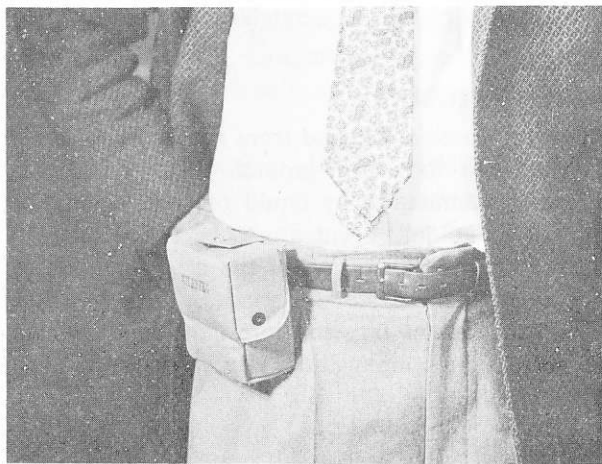


FIGURE 1.—Chemical Agent Detector Kit, CD V-810, carried on user's belt.

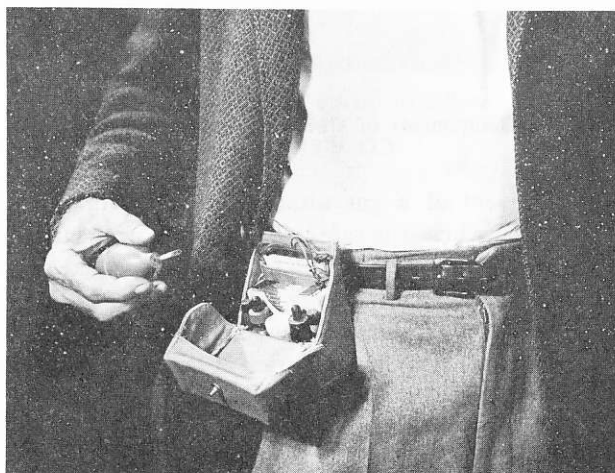


FIGURE 2.—Kit opened, with user holding aspirator bulb.

lanyard that is detachable from the kit and adjustable for wear on the wrist. (See fig. 2.)

The kit also contains:

- a. A plastic spring-type detector tube dispenser containing 50 modified blue dot detector tubes.
- b. A green top dropper bottle (¼ oz.) for nerve gas test solution.
- c. A blue top dropper bottle (¼ oz.) for mustard gas test solution.
- d. Supply of solid reagents for making solutions for b. and c.
- e. Set of instructions.

These components are shown in figure 3. The empty kit is shown in the background with the tube dispenser and set of instructions immediately in front of it. In the foreground are the green top and blue top dropper bottles with the supply of reagents for making solutions for them.



FIGURE 3.—Components of Chemical Agent Detector Kit, CD V-810.

In the event of a gas attack, tests with the kit may indicate when it is safe to remove the protective mask, whether gas is present in areas suspected of contamination, and whether gas is present after decontamination operations. (Decontamination will be discussed in the fifth in this series of technical bulletins, TB-11-32, *War Gas Decontamination*.)

When using the kit, first test for nerve gases (G), then for mustards (H). (The Army symbol for nerve gases is G and for mustards, H or HD.) If either test is positive, **KEEP PROTECTIVE MASK ON**. If both tests are negative, other toxic agents may still be present. Open mask slightly and sniff cautiously. If any watering of the eyes, coughing, or sneezing oc-

curs, or any unusual odors are noticed, **KEEP MASK ON**.

## PROCEDURES IN USING KIT

### Preparation of Solutions:

**GREEN BOTTLE:** Prepare a fresh solution *each day* kit is in use. Place powder from 1 plastic packet and 1 tablet from green vial into clean green bottle. Add clear water to bottle until half full and shake vigorously until no solid settles to bottom of bottle. Fill bottle to shoulder with more water and mix by shaking. *Wash bottle at end of day.*

**BLUE BOTTLE:** Add clear water to blue bottle until half full and shake until chemical dissolves. Fill bottle to shoulder with more water and mix by shaking. Solution may be used for an indefinite period of time. To replenish solution, empty contents of blue vial into cleaned blue bottle and dissolve in water as above.

### Sampling Bulb:

Remove bulb from kit. Adjust lanyard loop over wrist. Check bulb for leakage by inserting a solid tube (ends left on) into bulb and compressing. Bulb should not fully inflate in one-half minute. If leakage is found, a drop of oil or soapy water applied to the valve may help seat valve ball. Inspect bulb periodically for cracks, especially at ends. Obtain a new bulb if large cracks are found.

### Use of Tubes:

A separate tube is required for *each* nerve gas or mustard gas test. Remove tube from dispenser. Snap off both ends of tube at scratches and insert *dotted* end into bulb.

### Sampling (WHERE):

Test for gases *downwind* from source and sample air about one foot from ground. When testing for surface contamination by liquid or solid agents, or if puddles of liquid agent are to be tested, place a can or box over a portion of the area for about 5 minutes to concentrate the vapors. Then punch a hole in the can or box and insert the tube through the hole when sampling. *Do not allow the tube to touch liquid.*

### Sampling (HOW):

Grasp bulb in palm of hand and deflate *completely* by compressing with fingers. Release and allow bulb to inflate *fully*. Repeat 50 times for each nerve gas test. Repeat 12 times for each mustard gas test. These tests will not be reliable unless sampling bulb is completely deflated and allowed to inflate fully for

each bulb compression. Forty to fifty bulb compressions can be made per minute.

#### Test for Nerve Gases (G):

With a new tube in bulb, compress and release bulb 50 times as described above. Add liquid (usually 1 drop, from green bottle to *undotted* end of tube until grains are wetted. If a yellowish band appears in 1 minute or sooner, KEEP MASK ON.

#### Test for Mustard Gases (H):

With a new tube in bulb, compress and release bulb at least 12 times as described above. If temperature is 65° F. or above, let stand 2 minutes. If temperature is below 65° F., warm in palm of hand (inside glove) for 2 minutes. Add liquid (usually 1 drop) from blue bottle to *undotted* end of tube until grains are wetted. If a purple-blue band or ring appears immediately, KEEP MASK ON.

#### Interpretation (WHAT TO DO):

If either nerve gases (G) or mustards (H) are present, KEEP MASK ON. Conduct additional tests until both G and H tests are negative; open mask *slightly* and sniff *cautiously*. If no watering of the eyes, coughing, or sneezing occurs, and if no unusual odors are noticed, REMOVE MASK.

#### Precautions if Nerve Gases are Present:

When a negative test for nerve gas is obtained and no new gas attacks occur, a person is safe without a mask for at least 20 minutes. However, to guarantee longer safe periods, a negative test must be obtained with the number of bulb compressions indicated as follows:

Bulb compressions	Safe time without mask
50	20 minutes
100	40 minutes
150	1 hour
300	2 hours

#### Precautions if Mustard Gas Is Present:

When a negative test for mustard gas is obtained and no new gas attacks occur, a person is safe without a mask for at least 30 minutes. To guarantee longer safe periods, a negative test must be obtained with the number of bulb compressions indicated as follows:

Bulb compressions	Safe time without mask
12	½ hour
25	1 hour
50	2 hours
75	3 hours

NOTE—In the table above, double the time if the air temperature is below 70° F. Do not use detector tubes or contents of vials after discard date. *Store kit in cool place.* Storage at temperatures above 100°F. for extended periods of time renders kit useless.

In testing for presence of gas during night operations, the detector tube may be observed for color development with the aid of a flashlight.

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. Mark date of solution preparation on green and blue bottle.

Nerve gases (G) in low concentrations cause blurring of vision (pinpoint eye pupils) in unmasked persons. If such effects occur, everyone should *re-mask immediately* and further tests should be conducted.

The first three technical bulletins in the Chemical Warfare Defense Series are:

1. *Introduction to Chemical Warfare*, TB-11-25, July 1956.
2. *General Concepts of Chemical Warfare*, TB-11-26, July 1956.
3. *Chemical Warfare Agents of Special Significance to Civil Defense*, TB-11-28, January 1957.