

Civil Defense Simultest Kit

Quick Overview

Draeger Civil Defense Simultest Kit

- This visual presentation is intended to help the user understand use of the Draeger Civil Defense Simultest Kit. It is not intended to substitute for any specific instructions found in the Kit itself.
- Pictures may not represent suitable respiratory equipment and protective clothing for every situation. Proper protection level should always be determined by the specifics of an event.



Intended Use

- **The Draeger Civil Defense Simultest Kit is designed to provide a rapid identification of a chemical agent using specially designed and calibrated detector tube sets**



Intended Use

- **Primary users of the Civil Defense Simultest would include:**
 - ◆ **First Responders**
 - Fire Service
 - Emergency Response Teams
 - HazMat Teams
 - Federal Agencies



Components of Civil Defense Kit

- **accuro® Bellows Pumps(2)**
- **accuro® Spare Parts**
- **Civil Defense Set I (5)**
- **Civil Defense Set V (5)**
- **Simultest Extension Hoses accuro® (2)**
- **Simultest Set Openers (2)**
- **Laminated Instruction Cards**
- **Pelican Case**
- **Space for additional boxes of chemical specific Draeger-Tubes**



accuro® Pump

- The Draeger accuro® pump is the standard unit used for sampling with Draeger-Tubes.
- It is used to draw a calibrated 100 cc of air through the Simultaneous Test Sets on each pump stroke.
- Bellows design allows for easy one-hand operation.



The Simultaneous Test Sets

- **The Civil Defense Simultest Kit contains 2 separate semi-quantitative sets**
- **Each set consists of 5 different specially designed and calibrated detector tubes**
- **Sampling procedures and ambient condition criteria are the same for both test sets**
 - ◆ This system allows for a very rapid determination of 8 chemical warfare agents

CDS Simultaneous Set I

- **CDS Simultaneous Set I detects the following:**
 - ① Thioether (Sulfur Mustard)
 - ② Phosgene
 - ③ Hydrocyanic Acid
 - ④ Organic Arsenic Compounds & Arsine
 - ⑤ Organic Basic Nitrogen Compounds

- **5 of Set I are provided in the CDS Kit**



CDS Simultaneous Set V

- **CDS Simultaneous Set V detects the following:**

- ① Cyanogen Chloride
- ② Thioether (Sulfur Mustard)
- ③ Phosgene
- ④ Chlorine
- ⑤ Phosphoric Acid Esters

- **5 of Set V are provided in the CDS Kit**



Test Set Adapter and Hose for accuro

- A special adapter is used to connect the Simultest Set to the accuro® bellows pump
- This adapter consists of a 5 slot manifold for the tube sets, 1 meter extension hose and quick connect to pump



Using the Kit

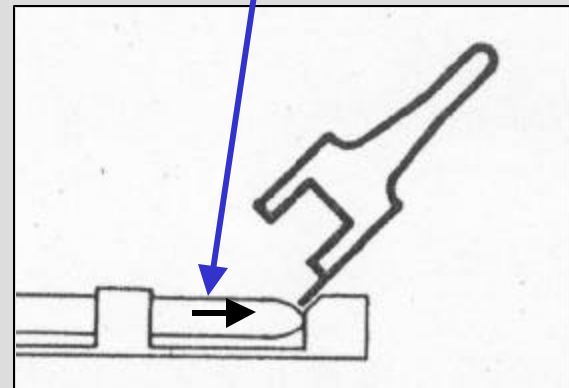
- To determine what substance(s) are present, both **Simultest Sets** should be used
- The order in which the tests are taken does not matter



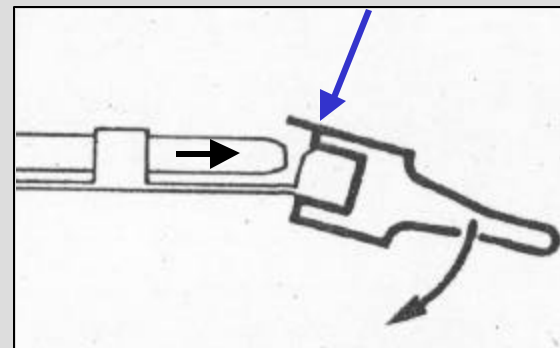
Opening the Simultest Sets

- Scrape ceramic edge of the Simultest Set Opener at multiple times to score the glass tips
- Push opener completely over rubber block with ceramic cutter up and apply pressure down until all tube tip break off
- Insert the tube set into the adapter (flow arrow pointing in) and then break tips on other side of set

Flow Indication Arrow

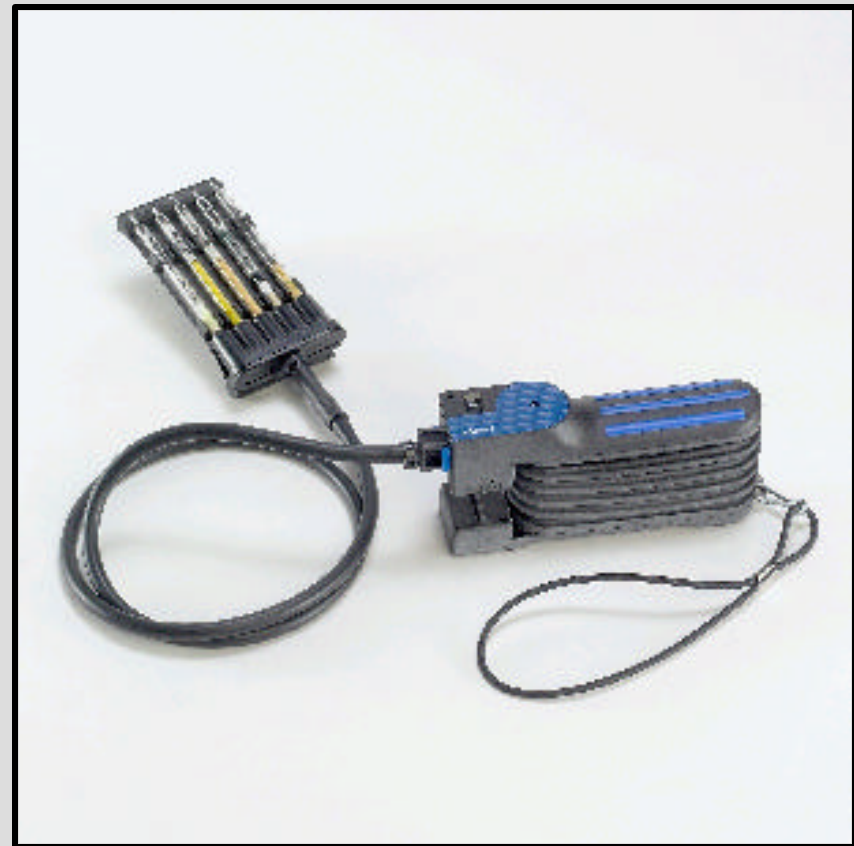


Ceramic cutter "up"



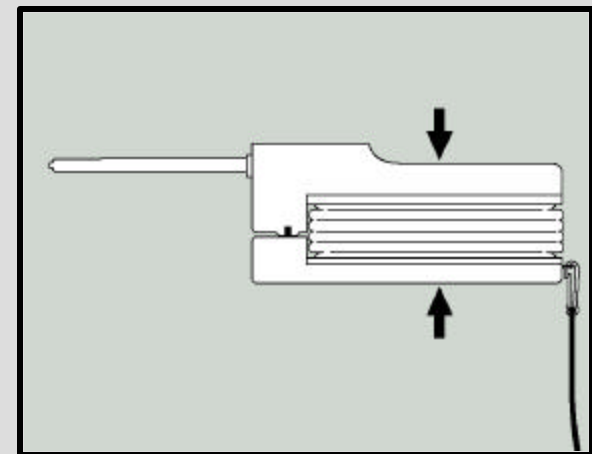
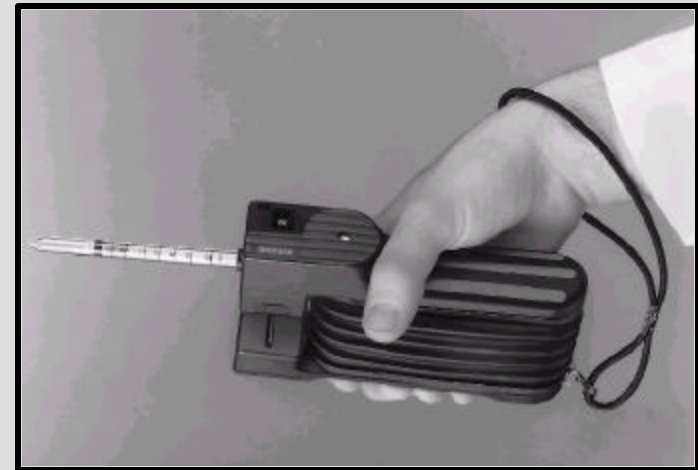
Assembling the System

- **Assemble the Tube Set, Extension Hose and accuro Pump as shown**



Operation of the accuro® Pump

- Grip the pump as shown.
- Squeeze the pump until it will no longer compress (the stroke indicator will have advanced)
- Allow the bellows to re-expand by itself until reappearance of the white dot on top indicates end of stroke



Operation of CDS Sets I & V

- **Each set operates with n=50 strokes**
 - ◆ Approx. 2.5 minutes
- **Some tubes contain ampoules that require additional steps**
 - ◆ Refer to laminated card for details
- **Total test time and evaluation for each set is 5 minutes**



Laminated Instructions Set I

- Provide a quick reference to the easy use instructions and color change interpretations

CDS – Simultaneous Test Set I

Ambient Conditions

- Temperature: 5 °C to 30 °C
- Humidity: 5 to 15 mg H₂O / liter

Measurement outside the given temperature and humidity ranges may affect sensitivities. Water aerosols can produce minus errors.

Measurement Procedure

- Open the tubes.
- Draw the air sample through the tube set with 50 strokes.

Reading Evaluation

After completing the 50 strokes, remove the **Thioether tube (No. 1)** (**Sulphur Mustard**) from the holding device. Bend the Thioether (Sulphur Mustard) tube at the point between the two dots so that the internal reagent ampoule breaks. Shake the tube to distribute the reagent solution onto the yellow indicating layer.

Evaluation: orange ring on the yellow indicating layer means Thioether (Sulphur Mustard) is present.

After completing 50 strokes, remove the **Organic Arsenic Compounds/Arsine tube (No. 4)** from the holding device. If a dark ring in the indicator gauge appears, arsine is present. Testing for organic arsenic compounds is no longer possible. If no discoloration occurs, the tube should be removed from the holding device and bent at the point between the two black dots, so that the inner reagent ampoule breaks. This tube should be inserted individually into the pump to perform 8 more pump strokes. If a dark ring appears in the indication layer, organic arsenic compounds are present.

Substance	Color Change	Sensitivity
Organic basic nitrogen compounds	yellow → orange-red	1 mg/m ³
Organic Arsenic Compounds and Arsine	yellow → grey	0.1 ppm Arsine (higher organic arsenic compounds)
Hydrocyanic Acid (HCN)	yellow → red	1 ppm
Phosgene	yellow → blue-green	0.2 ppm (approx. 20 min. pale green)
Thioether (Sulphur Mustard)	yellow → orange	1 mg/m ³

8103140

Unused Tube

Used Tube

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PIN 4056370 Rev. 1

Laminated Instructions Set V

- Refer to the laminated cards for quick interpretation of any color changes in the tubes

CDS – Simultaneous Test Set V

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Ambient Conditions

- Temperature 5 °C to 30 °C
- Humidity 5 to 15 mg H₂O / liter

Measurement outside the given temperature and humidity ranges may affect sensitivities. Water aerosols can produce minus errors.

Measurement Procedure

- Open the tubes.
- Before beginning the test, remove the Cyanogen Chloride Tube (No. 1) from the holder. Open the reagent ampoule by bending the tubes to approx. 45° (on the spot between the two black dots). Allow the ampoule fluid to flow onto the indicator layer until it is completely moistened. Again tightly place the tubes in the holder and adapter. Arrow should point toward the pump.
- Draw the air sample through the tube set with 50 strokes.

Reading Evaluation

After 50 pump strokes, take the Phosphoric Acid Ester tube (No. 5) out of the holder. Open the reagent ampoule by bending the tube by approx. 45° (at spot between the two black dots). Shake the liquid from the ampoule onto the first white layer until it is completely moistened. The second white layer should not be moistened in this process. Wait for 1 minute. Using the pump, carefully draw the liquid onto the second white layer up to the marking line in front of the yellow indicating layer. The yellow layer should not be moistened in this process. Wait for 1 minute. Again using the pump, draw the liquid onto the indicating layer. Measuring range: 0.025 ppm dichlorous.

Evaluation: if the indicating layer turns red and the discoloration remains stable for 1 minute, phosphoric acid ester is present.

After completing the 50 strokes, remove the Thioether tube (No. 2) (Sulphur Mustard) from the holding device. Bend the Thioether tube at the point between the two dots so that internal reagent ampoule breaks. Shake the tube to distribute the reagent solution onto the yellow indicating layer.

Evaluation: orange ring on the yellow indicating layer means Thioether is present.

Substance	Color Change	Sensitivity
Phosphoric Acid Ester	yellow → red	0.025 ppm Dichlorous
Chlorine (Cl ₂)	white → yellow - orange	0.2 ppm
Phosgene	yellow → blue - green	0.2 ppm (approx. 20 min path green)
Thioether (Sulphur Mustard)	yellow → orange	1 mg/m ³
Cyanogen Chloride	white → pink	0.25 ppm (at 0.25 ppm the indicating layer has the same color as comparison layer)

Unused Tube

Used Tube

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Evaluating the Results

- *Information on cross sensitivity important to detailed interpretation of the color change results is given in the specific Test Set instructions*
- *Even though the Simultest may present a negative result, the presence of other harmful gases cannot be precluded*