Canadian General Standards Board

Office des normes générales du Canada

CGSB

ONGC

136-GP-Series
Série des 136-GP

# CANCELLATION

April 1983

CANADIAN GENERAL
STANDARDS BOARD

Standard for

POLICE EQUIPMENT

All fourteen provisional standards in this series are hereby cancelled due to a lack of interest. These standards are listed on the following pages.

# ANNULATION

Avril 1983

OFFICE DES NORMES
GÉNÉRALES DU CANADA

Norme

MATÉRIEL POLICIER

Les quatorze normes provisoires de cette série sont annulées par la présente parce qu'elles ne suscitent plus aucun intérêt. Ces normes sont énumérées aux pages suivantes.

Canada

Ottawa, Canada K1A 1G6

| Standard No.<br>Nº de norme | Title<br>Titre | Date of Issue<br>Date de parution |
|---|---|---|
| *136-GP-1P | Silica, Colloidal, Synthetic<br>Silice colloïdal synthétique | May 75<br>Mai 75 |
| *136-GP-2P | Chemical Agent, CS<br>Agent chimique, CS | May 75<br>Mai 75 |
| *136-GP-3P | Chemical Agent, CS 1<br>Agent chimique, CS 1 | October 75<br>Octobre 75 |
| *136-GP-4P | Chemical Agent, CS 2<br>Agent chimique, CS 2 | October 75<br>Octobre 75 |
| *136-GP-5P | Chemical Agent, CR<br>Agent chimique, CR | October 75<br>Octobre 75 |
| 136-GP-10MP | Grenades, Tear Gas, Pyrotechnic Type, for Open Area Use<br>Grenades lacrymogènes de type pyrotechnique utilisées en milieu ouvert | March 79<br>Mars 79 |
| 136-GP-12MP | Grenades, Tear Gas, Pyrotechnic Type, for Enclosed Space Use<br>Grenades lacrymogènes de type pyrotechnique utilisées en milieu fermé | March 79<br>Mars 79 |

*Unilingual Standard
Norme unilingue

| Standard No.<br>Nº de norme | Title<br>Titre | Date of Issue<br>Date de parution |
|---|---|---|
| 136-GP-14MP | Cartridges, Tear Gas, 12 Gauge, for Enclosed Space Use<br>Cartouches, gaz lacrymogène, calibre 12, utilisées en milieu fermé | March 79<br>Mars 79 |
| 136-GP-18MP | Grenades, Smoke, White<br>Grenades à fumée blanche | March 79<br>Mars 79 |
| *136-GP-25P | Highway Fusees, Red<br>Torches à flamme rouge, pour autoroutes | October 75<br>Octobre 75 |
| 136-GP-26MP | Thunderflashes<br>Pétards | May 77<br>Mai 77 |
| 136-GP-27MP | Paraflares, Hand-Held<br>Fusées éclairantes à parachute, à main | March 79<br>Mars 79 |
| 136-GP-85MP | Sunglasses, for Police Use<br>Lunettes de soleil pour policiers | June 77<br>Juin 77 |
| 136-GP-90MP | Ink, Fingerprint<br>Encre, empreintes digitales | April 77<br>Avril 77 |

*Unilingual Standard
Norme unilingue

Specifications Board
Supply and Services Canada

Office des Normes
Approvisionnements et Services Canada

# Provisional Standard for: Chemical Agent, CS2

This provisional standard applies to one type of riot control agent, the active ingredient of which is o-chlorobenzalmalononitrile.

Withdrawn/Retirée

136-GP-4P

October 1975

Price Code A

Pour l'édition française commander (F)136-GP-4P

*This provisional standard has been issued to meet a procurement need. It has not been ratified by the Board.*

Standards Officer - H.E. Mitton, CGSB

Withdrawn/Retirée

## FOREWORD

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Canadian Government Specifications Board
6th Floor, 88 Metcalfe Street
Ottawa, Ontario
Canada
K1A 0S5

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CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Provisional Standard
for

# CHEMICAL AGENT, CS2

## 1. DEFINITION

1.1 This provisional standard applies to one type of riot control agent, the active ingredient of which is o-chlorobenzalmalononitrile.

1.2 For uses see par. 6.2.

## 2. APPLICABLE PUBLICATIONS

2.1 The following publications are applicable to this standard.

2.1.1 American Society for Testing Materials (ASTM)

E 29 Recommended Practice for Indicating which Places of Figures are to be Considered Significant in Specified Limiting Values.

E300 Recommended Practice for Sampling Industrial Chemicals.

2.1.2 Canadian Government Specifications Board (CGSB)

8-GP-1 Sieves, Testing, Woven Wire.

2.1.3 Canadian Transport Commission (CTC)

Regulations for the Transportation of Dangerous Commodities by Rail.

2.1.4 Code of Federal Regulations (CFR)

49 CFR 171-179 Department of Transport Transportation Rules and Regulations for the Transportation of Explosives and other Dangerous Articles.

2.2 Reference to the above publications and to test methods therein is to the latest issues, unless otherwise specified.

## 3. DETAIL REQUIREMENTS

NOTICE: CS2 shall comply with the detail requirements below, the limits of which are absolute and not subject to correction for tolerance of test procedures (par. 5.4).

3.1 Composition - CS2 shall be a uniformly blended mixture of 93.0 to 96.0% by mass of ground CS conforming to par. 3.1.1 and 4.0 to 7.0% by mass of HMDS-treated silica conforming to par. 3.1.2.

Par. 5.3.1

3.1.1 *Ground CS* - The CS used to prepare CS2 shall conform to CGSB 136-GP-2. Prior to blending operations it shall be ground so that it will have an average particle diameter of 7 µm or less by Fisher Sub Sieve Sizer. (Silica conforming to par. 3.1.2.1 may be added to the CS as a grinding aid provided that it is treated with HMDS (hexamethyldisilazane) during the final blending operation).

3.1.2 *HMDS-treated Silica* - The HMDS-treated silica shall contain 80 to 90% by mass of colloidal silica (par. 3.1.2.1) and 10 to 20% by mass hexamethyldisilazane (HMDS) (par. 3.1). The HMDS-treated silica shall have an absorbance ratio of not less than 6.4.

Par. 5.3.2

3.1.2.1 *Silica* - The silica shall be synthetic, colloidal and shall comply with CGSB 136-GP-1.

3.2 Flow Properties - 96.0% by mass of the CS2 shall pass through the test funnel in 7.0 seconds or less when tested as specified.

Par. 5.3.3

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3.3 Apparent Density - CS2 shall have an apparent density of 0.20 g/cm$^3$ or greater.

Par. 5.3.4

3.4 Ultimate Particle Size - CS2 shall have an ultimate particle size no greater than 9 µm at 50% by mass cumulative and no greater than 12 µm at 80% by mass cumulative.

Par. 5.3.5

3.5 Agglomeration - No more than 1.5% by mass of CS2 shall be retained on a 850 µm (No. 20) sieve and no less than 70% by mass of CS2 shall pass through a 45 µm (No. 325) sieve.

Par. 5.3.6

3.6 Mechanical Wetting Resistance - CS2 shall retain its ability to re-aerosolize (form a dust cloud) when tested as specified.

Par. 5.3.7

3.7 Hydrophobicity - CS2 shall have hydrophobic characteristics which yield a minimum slope of 0.33 ml/mg when tested as specified.

Par. 5.3.8

3.8 Container Leakage - Containers of the product shall not show evidence of leakage when subjected to a 24 inch drop test.

Par. 5.3.9

3.9 Preproduction - Unless otherwise stated a preproduction lot of CS2 shall be produced for examination and approval of customer agency prior to the start of regular production.

## 4. PREPARATION FOR DELIVERY

4.1 Packaging - The CS2 shall be packaged in quantities of 8 pounds ± 2 ounces (3625 ± 50 g) in plastic bottles of 3 gallons (13 ℓ ) capacity. Each filled bottle shall be closed by tightening its properly engaged screw cap onto the threaded neck with a torque of 40 ± 5 inch-pounds (4.5 ± 0.5 N.m). Each filled and closed bottle shall be subjected to the leakage test specified in par. 5.3.9. If there is no leakage the tightened screw cap shall be further secured to the neck of the bottle with weather resistant preservation and sealing pressure sensitive adhesive tape at least 2 inches (5 cm) in width. The tape shall be tightly wound around the neck of the bottle and the cap for a minimum of two complete turns. The tape shall extend from the top of the cap to a circumferential line around the bottle spout no less than 3/4 inch (20 mm) below the bottom of the tightened cap. The plastic bottle and closure shall be free of CS2 contamination.

4.2 Packing - The plastic bottles of CS2, packaged as specified in par. 4.1 shall be packed side by side, in an upright position, with pouring spouts facing in alternate directions in a close-fitting fiberboard box. The box shall be regular slotted style (RSC) constructed from single wall domestic class, grade 125 or better corrugated fiberboard. Separators of the same material shall separate the plastic bottles and assure a tight pack. A flat fiberboard pad of the same material extending the full length of the box shall be placed on top of the handles and between the spouts and shall have sufficient thickness to extend 1/4 inch (5 to 7 mm) above the spout closures. The fiberboard box shall be closed and sealed and enclosed in a heat-sealed bag formed from plastic and nonwoven barrier material. The fiberboard box, in its bag, shall be placed in a nailed wooden box, the inside dimensions of which shall be sufficient to permit pads of weather resistant corrugated or solid fiberboard to be inserted between the heat-sealed bag and all six interior surfaces of the wooden box. The wooden box shall be closed and strapped with galvanized steel strapping. The empty box or the finished wood parts thereof shall have been immersed for no less than 3 minutes in a water repellent wood preservative.

4.3 Marking - In addition to any special markings required by the purchaser the exterior package shall be marked in compliance with the rules and regulations applicable to the mode of transport. In addition, the centers of diagonally opposite vertical edges of the exterior package shall be color coded with two red stripes on a grey background and marked with the symbol CS2 (See Fig. 1).

## 5. INSPECTION

5.1 General - Unless otherwise stipulated in the contract, it is the prime contractor's responsibility to satisfy the inspection authority that the commodity conforms to this standard. This may be accomplished either by performing the tests specified in this standard or by demonstrating to the satisfaction of the inspection authority that manufacturing processes and techniques are so controlled that conformity to this standard is ensured. The contractor may, for this purpose, utilize his own facilities or other testing establishment acceptable to the inspection authority.



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5.2 Sampling - A representative sample shall be taken for inspection tests in accordance with good sampling practice. ASTM E 300 provides guidance on sampling solids (powders).

5.3 Testing

(NOTE: Water in accordance with ASTM D 1193 and reagent grade chemicals shall be used throughout the tests.)

5.3.1 *Composition* - Weigh approximately 10 g of specimen to the nearest mg into a tared crucible. Ignite the crucible contents to a constant weight at 700 ± 10°C. Cool in a desiccator and reweigh. Calculate percent CS as follows:

$$\text{Percent CS} = 100 - \frac{100\ A}{B}$$

Where: A = Weight of residue (g)

B = Weight of specimen (g)

Calculate the percent HMDS - treated silica as follows:

Percent HMDS-treated silica = 100 - percent CS

5.3.2 *Absorbance Ratio of HMDS-treated Silica* - Using 100 mm x 100 mm x 0.5 mm silver chloride sheets (see 6.10), carefully punch out 13 mm discs if using the Perkin-Elmer macro die, or discs of the appropriate size to fit the plunger of the pellet die that is used. Make sure that any lubricant is first removed from the punch and die surfaces that will contact the silver chloride sheet. Conduct the operation under reduced light. Store the discs in the dark. Place the disc in the bottom of the pellet die. Add 7 to 8 mg of the HMDS-treated silica specimen. Tap the die on a table several times to obtain a uniform layer of the specimen on the disc. Without evacuation, press for 1 min at 6.9 MPa (1000 psi) in a Carver Laboratory Press, Model B. Remove the pellet and by means of an infrared spectrophotometer, scan quickly through the 3745 $cm^{-1}$ and 2965 $cm^{-1}$ regions to insure that the pellet is in the correct thickness (absorbance) range. Absorbance values between 0.5 and 1.0 are acceptable for quantitative work, with a desirable value of 0.6 to 0.7. If necessary, remake the pellet. Insert the pellet in a quartz spectrophotometer cell and condition the pellet in a vacuum at a temperature of 110°C for 1 h. Cool to room temperature, align the quartz spectrophotometer, and obtain the spectrum between 4000 $cm^{-1}$ and 1200 $cm^{-1}$. Determine the net absorbance, in absorbance units from the respective base lines, at 2965 $cm^{-1}$ and 1860 $cm^{-1}$. Calculate the absorbance ratio as follows:

$$\text{Absorbance ratio} = \frac{\text{Net absorbance at 2965 cm}^{-1}}{\text{Net absorbance at 1860 cm}^{-1}}$$

5.3.3 *Flow Properties* - Transfer approximately 50 g of the sample to a 1-pint Mason jar. Pour the specimen from the jar to a second Mason jar and repeat until the inner surfaces of both jars are coated with the specimen. Pass some of the specimen through a test funnel conforming to Figure 2. Tap the jars and funnel to remove excess specimen. Tare weigh each jar with lid but not lid sealing ring. Place a primed receiver jar on a ring stand fitted with a 3-inch inside diameter ring, over the positioned receiver jar. (A block of wood placed under the jar is suggested to facilitate subsequent removal). Tentatively rest funnel in ring. Into the second jar, weigh 20 ± 0.1 g of specimen. With one hand, hold the jar and lid in place and shake vigorously for approximately 10 s to fluidize the specimen, remove the lid, cover the jar with the test funnel, and immediately invert the jar-funnel assembly over the receiver jar, allowing the funnel to rest on the ring. Remove the empty inverted jar from the funnel. (The time lapse between the shaking of the capped jar and the inversion of the jar-funnel assembly should be kept to a minimum to prevent settling of the fluidized specimen. The flow of fluidized specimen through the funnel must be by gravity alone; shaking the assembly in any way to assist flow is not permitted). Time the pouring process, starting the time as soon as the first material touches the funnel. Stop the timer when all material has passed the funnel discharge or when the material stops flowing, whichever occurs first. Record the time in seconds. Remove the receiving jar, replace the lid, and weigh. Tap the residue on the funnel into another tared jar and weigh. Calculate the percent passing through test funnel as follows:

$$\text{Percent passing through test funnel} = \frac{100\ A}{(A + B)}$$

Where: A = Weight of specimen passing through funnel (g)

B = Weight of specimen tapped from test funnel (g)

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The total of A + B shall be no less than 19 g for the test to be valid.

5.3.4 *Apparent Density* - Add 20 ± 1 g of specimen, by gravity feed, to a tared 100 or 150 ml graduated cylinder. Let the specimen settle undisturbed for 10 min, read the fill volume to the nearest ml graduation, and record. Weigh the cylinder and specimen. Calculate apparent density as follows:

$$\text{Apparent density } (g/cm^3) = \frac{A - B}{V}$$

Where: B = Tare weight of cylinder (g)

A = Mass of cylinder and specimen (g) and

V = Volume of specimen (ml)

5.3.5 *Ultimate Particle Size*

5.3.5.1 *Apparatus*

(a) Microscope equipped as follows:

(1) Compensating eyepiece, 10X.

(2) Apochromatic objective, 43X (4 mm) with a 0.95 numerical aperture, and a correction collar for cover glass thickness variation.

(3) Aplanatic apochromatic sub-stage condenser of high numerical aperture.

(4) Stage micrometer, consisting of a reticle mounted on a standard 25 x 75 mm glass slide. The reticle has a millimetre scale divided into 100 divisions each scale division being equivalent to 10 µm.

(5) Microscope slides, glass, standard 25 x 75 mm

(6) Cover glasses, No. 1, 19 mm diameter.

(7) Projection equipment and screen. A right-angled eyepiece lens may be used together with a projection screen or a ground glass screen. The distance between the projection screen and the microscope must be capable of being varied.

(b) Transparent ruler, graduated in millimetres

(c) Hand magnifying glass for better viewing when measuring the particles projected on the screen.

(d) Eye-dropper

(e) Logarithmic probability graph paper.

(f) Beaker, 200 ml capacity, tall form.

(g) Light mineral oil

(h) Stirrer, electric, operating at 1650 ± 150 rpm, and having twin blades not exceeding a total of 43 mm in diameter.

5.3.5.2 *Calibration* - Place the micrometer scale slide on the stage of the microscope in normal position. Project the image onto the screen. Adjust the distance between the microscope and projection screen so that 10 divisions of the image (on the screen) measure 67 mm with a graduated transparent ruler placed against the screen. Each division of the ruler (1 mm) corresponds to 1.5 µm on the microscope slide.

5.3.5.3 *Procedure*

(a) *Preparation of Sample on Slides* - Transfer approximately 0.100 g of specimen into each of 2 beakers. To one, add 20 ml of light mineral oil and mix with the electric stirrer for 5 min ± 30 s. While stirring, withdraw a portion of the mixture with an eye-dropper from a point

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approximately one-fourth the diameter of the beaker, measured from the inside wall of the beaker and just above the top of the stirrer blades. Immediately wipe off the outside of the eye-dropper and deposit one drop of the mixture on a clean, dry microscope slide. Cover the drop with a cover glass. Prepare a second slide in the same manner. Follow the same procedure with the second beaker and prepare a second pair of slides.

(b) Measurements - Mount one of the slides on the microscope stage and project the image. Place the transparent ruler horizontally across the image so that the field is approximately bisected. Determine, to the nearest millimetre, the maximum length of the horizontal projection of each particle successively encountered regardless of the orientation of the particle, excluding clusters of particles or agglomerates. When the edge of the field of vision is reached continue measurements parallel to the above measurement but sufficiently distant so that none of the previously counted particles are measured. Continue traversing the field completely and measuring particles until at least 200 particles having a length of over 1.5 µm are counted. A hand magnifying glass may be used to assist in the measurement of the particles. If one-fourth or more of the field of vision is occupied by clusters of particles (agglomerates), discard the sample in that beaker and prepare a replacement for determination. Disregard any results from that beaker and use the results from a replacement beaker in which the particles are not agglomerated when averaging the results from the four slides. Photomicrograph techniques are permitted in the particle counting in lieu of screen projection.

(c) Tabulation of Frequency Distribution - As the particles are measured, tally them into class intervals as follows:

| Class Interval (mm) (Projection Screen) | Midpoint of Class in µm | Frequency (assumed as an example) |
|---|---|---|
| 0.0- 0.5 | ---- | Disregard |
| 0.6- 1.5 | 1.5 | 87 |
| 1.6- 2.5 | 3.0 | 115 |
| 2.6- 3.5 | 4.5 | 59 |
| 3.6- 4.5 | 6.0 | 26 |
| 4.6- 5.5 | 7.5 | 14 |
| 5.6- 6.5 | 9.0 | 6 |
| 6.6- 7.5 | 10.5 | 1 |
| 7.6- 8.5 | 12.0 | 1 |
| 8.6- 9.5 | 13.5 | 0 |
| 9.6-10.5 | 15.0 | 0 |
| 10.6-11.5 | 16.5 | 0 |
| 11.6-12.5 | 18.0 | 0 |

(d) *Calculation of Particle Size* - After recording and totaling the number of particles in each class, calculate the percent cumulative as follows (see table 1):

$$\text{Percent cumulative} = \frac{nd^3 \text{ cumulative} \times 100}{\text{total } nd^3}$$

On logarithmic probability graph paper plot the class size in µm on the logarithmic scale and the percent cumulative by mass on the other scale. From the curve, determine the particle size at the 50% cumulative intercept and at the 80% cumulative intercept. Repeat the procedure for each of the remaining slides. Average the results obtained. Table 1 shows the recording of typical data.

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TABLE I

Example Sample Data

| d | n | $d^3$ | $nd^3$ | $nd^3$ cumulative | Percent by mass cumulative |
|---|---|---|---|---|---|
| 1.5 | 87 | 3.375 | 294 | 294 | 1.1 |
| 3.0 | 115 | 27.00 | 3,105 | 3,399 | 12.3 |
| 4.5 | 59 | 91.12 | 5,376 | 8,775 | 31.8 |
| 6.0 | 26 | 216.0 | 5,616 | 14,391 | 52.2 |
| 7.5 | 14 | 421.9 | 5,906 | 20,297 | 73.7 |
| 9.0 | 6 | 729.0 | 4,374 | 24,671 | 89.5 |
| 10.5 | 1 | 1,158 | 1,158 | 25,829 | 93.7 |
| 12.0 | 1 | 1,728 | 1,728 | 27,557 | 100.0 |
| 13.5 | --- | 2,460 | ----- | ------ | ----- |
| 15.0 | --- | 3,375 | ----- | ------ | ----- |
| 16.5 | --- | 4,492 | ----- | ------ | ----- |
| 18.0 | --- | 5,832 | ----- | ------ | ----- |

d = midpoint of class in micrometres
n = number of particles tallied in class interval.

A plot of the sample data shows that the particle size equals 5.5 µm at 50% cumulative and 8.3 µm at 80% cumulative.

5.3.6 *Agglomeration* - Use sieves conforming to CGSB 8-GP-1. Nest a 850 µm (No. 20) sieve on top of a 45 µm (No. 325) sieve and place a receiving pan on the bottom and a cover on top. Weigh to the nearest 0.1 g approximately 50 g of the specimen and quantitatively transfer to the 850 µm sieve. Tape the outside of the assembly and place it in a mechanical shaker geared to produce 300 ± 5 gyrations and 150 ± 10 taps of the striker per min. Vibrate for 20 min with the tapper in operation. Weigh the specimen retained on the 850 µm sieve and calculate the percent retained. Weigh the specimen on the bottom pan and calculate the percent passing through the 45 µm sieve.

5.3.7 *Mechanical Wetting Resistance*

(a) *Apparatus* - Use a wrist action shaker adjusted to a vibration amplitude of 19 ± 1.5 mm and a vibration frequency of 300 ± 10 oscillations per min at a distance of 57 ± 3 mm from the center of oscillation (par. 6.9).

(b) *Procedure* - Weigh 0.50 g of the specimen into a 50 mm diameter, 4-oz wide mouth jar. Add 70 ml of water having a temperature of 25 ± 3°C. Cap the jar and position it in a shaker having the characteristics specified in (a). Shake the jar for 40 ± 0.5 min. Remove the jar from the shaker and shake manually several times. Remove the cap and using a contrasting background, observe any reaerosolization (dust cloud formation) of the specimen.

5.3.8 *Hydrophobicity*

(a) *Standard Detergent Solution* - Prepare a solution of "Sparkleen" detergent (par. 6.8) in water at a concentration of 10 g/ℓ. Allow to stand for 24 h at room temperature. Transfer 200 ml of the solution to a 1 ℓ volumetric flask and dilute to the mark with water. This solution contains 2 g/ℓ of "Sparkleen".

(b) *Procedure* - Weigh to the nearest 0.1 mg approximately 0.015 g of the specimen into a 100-ml graduated cylinder fitted with a ground glass stopper. Carefully add 20 ml of water, stopper, and shake vigorously. (At this point the specimen should be "crawling" up the walls of the cylinder. Some particles may appear to be wetted but the majority of the specimen should remain at the surface of the water.) Add from one-fourth to one-third of the weight of the specimen in ml of the standard detergent solution prepared as specified in (a). (For example, if the specimen weighs 36.0 mg, 9 to 12 ml of detergent solution would be added.) Agitate by inverting the cylinder. When adding detergent, do not shake. Invert the cylinder two or three times, making sure that the detergent solution is evenly distributed throughout the mixture and that it comes in contact with all of the specimen. (At this point, the specimen should no longer "crawl" up the walls of the cylinder. The solution should be cloudy and after 1 min, one-third to one-half of the specimen should be at the top of the liquid. Any suds

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that had formed initially upon inversion should rapidly disappear.) Add more of the standard detergent solution in 4 ml aliquots until the suds formed fail to degenerate after standing for 2 min. Then add the standard detergent solution in 2 ml aliquots until the suds remain stable for 5 min and there is a definite tendency for the particles to settle. (At the end of 5 min of standing, about 2 to 6 ml of solution directly beneath the surface may be relatively clear of particles.) Verify the end point by adding an additional 2 ml aliquot of standard detergent solution and agitate. If at the end of 5 min, the characteristics of the solution have not changed, the end point has been reached. Repeat the entire procedure using 0.030 g and 0.045 g of the specimen weighed to the nearest 0.1 mg.

(c) *Calculations* - Plot on coordinate paper, mg of specimen, on the x-axis versus ml of standard detergent solution added, on the y-axis.

Determine the slope of the line formed by the plotted points as follows:

$$\text{Slope} \quad \frac{y_2 - y_1}{x_2 - x_1}$$

Where: $x_2$ and $x_1$ = Masses of specimen in milligrams and

$y_2$ and $y_1$ = Volumes of standard detergent solution added in millilitres.

*PRECAUTIONS*

1. When the 20 ml of water is added to the specimen, the specimen is shaken as a check. If the specimen is immediately wetted or mostly wetted (70 to 90%), the cylinder may not have been clean and the test should be repeated using a clean cylinder. If the same behavior is again observed, it is probable that the specimen is very poor and the standard detergent solution should be added in 2 ml aliquots from the beginning.

2. The time required from the addition of the first aliquot of standard detergent solution to the end point usually is 10 to 20 min. The maximum time allowed is 30 min since the specimen will appear to be less hydrophobic when it is allowed to remain in the presence of the standard detergent solution for a longer period of time. If the specimen is tested in less than 10 min, it will appear to be more hydrophobic than it is.

3. After a test is completed, 5 to 10 ml of acetone should be added to the specimen solution and the mixture should be shaken. The acetone will aid detoxification.

5.3.9 *Leakage of Plastic Bottle* - Conduct the test in a well-ventilated hood. Lift the sample plastic bottle until the bottom of the bottle is 24 ± 2 in. (60 ± 5 cm) above a horizontal surface. Hold the bottle in the normal upright position with the cap at the top and drop onto the horizontal surface. Examine for visible emission of CS2 from the bottle during or after impact.

5.4 Assessment of Conformance to the Standard - For tests carried out by the inspecting laboratory, average results will be used if multiple determinations are made. For those test methods where repeatability data are given the average value derived from the individual results that agree within the repeatability limits may be used at the discretion of the Inspection Authority, provided an indication is given of the total number of results obtained and of the number falling outside the repeatability limits. To determine conformance with each requirement, an observed value or calculated value shall be rounded off to the nearest unit in the last right-hand place of figures used in expressing the limiting value, in accordance with the rounding-off procedure given in ASTM E 29.

## 6. NOTES

6.1 Ordering Data - Procurement documents for chemical agent to this standard should specify the following:

(a) Title, number and date of this standard.

(b) Quantity required.

(c) Special marking, if any, required (par. 4.3).

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6.2 Intended Use - CS2 is intended for use in riot control.

6.3 Precaution - CS2 produces irritating physiological effects, such as stinging sensations to moist skin, running nose, sneezing, coughing, and burning of the eyes accompanied by a copious flow of tears. It should be handled with care. Surgical rubber gloves and goggles should be worn and tests should be performed under a hood.

6.4 The publications listed in par. 2.1.1 may be obtained from the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103 U.S.A.

6.5 The publication listed in par. 2.1.2 may be obtained from the Canadian Government Specifications Board.

6.6 The publication listed in par. 2.1.3 may be obtained from Information Canada, 171 Slater St., Ottawa, Ont. K1A 0S9. For interpretation consult the Canadian Transport Commission, 275 Slater St., Ottawa, Ont. K1A 0N9.

6.7 The publication listed in par. 2.1.4 may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Orders must cite "49 CFR 171-179".

6.8 "Sparkleen" Detergent - "Sparkleen" detergent is available from Fisher Scientific Company.

6.9 Wrist Action Shaker - A Burrell, Model BT shaker, available from the Burrell Corporation, Pittsburgh, Pennsylvania, has been found satisfactory for the mechanical wetting resistance test.

6.10 Silver Chloride Sheets - Silver chloride sheets for the absorbance ratio of HMDS-treated silica test may be obtained from the Harshaw Chemical Company, 1945 E. 97th Street, Cleveland, Ohio 44106.

6.11 HMDS - Sources of hexamethyldisilazane found suitable for use in preparation of CS2 are:

(1) Dow Corning - "Z-6079 Silane"

(2) General Electric - "SC-3726

(3) Union Carbide - "Y-7028"

(4) Peninsular Chemresearch - "OZ-34021-22".

6.12 Acknowledgement - This provisional standard is technically similar to U.S. Military Specification MIL-R-51341 and acknowledgement is made of assistance from this source.

6.13 Système International (Metric) Units - The SI (Metric) equivalents for customary yard/pound units are shown in this standard. Since the equivalents are not exact, the SI values are provided for information only to familiarize readers with metric units. Readers are cautioned that the multiples and sub-multiples of the units used in this standard may not be the same as those eventually established as a result of deliberations by the Metric Commission. This is NOT a soft conversion.

Withdrawn/Retired

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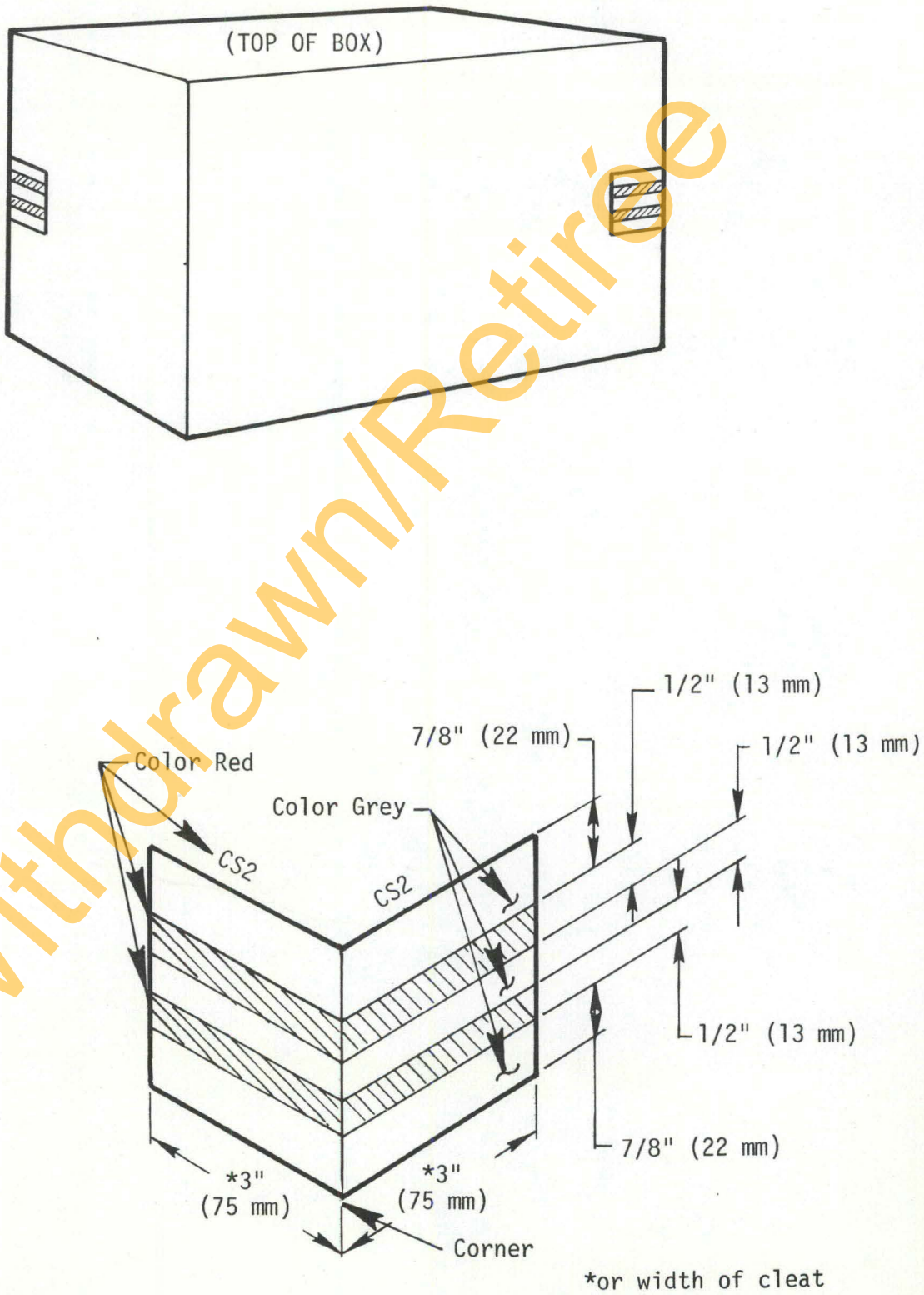
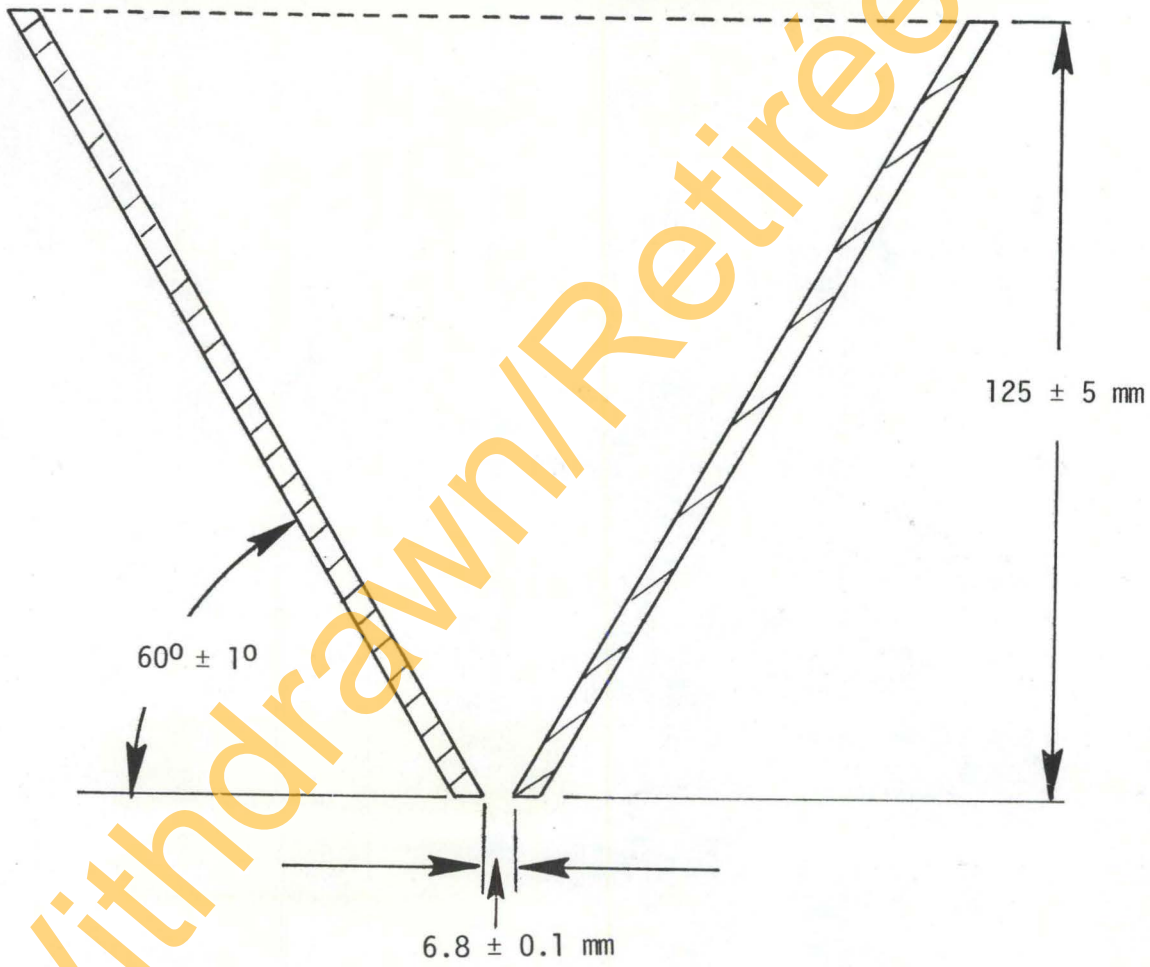



**FIGURE 1**

Withdrawn/Retirée




Withdrawn/Retirée

Material: Rigid Vinyl Acetate, planished, 3 mm thick.

Construction: Vacuum formed, apex filed or ground to specified orifice. Orifice through apex shall not be drilled.

**FIGURE 2**