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

*Unilingual Standard
Norme unilingue

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

*Unilingual Standard
Norme unilingue

Specifications Board
Supply and Services Canada

Office des Normes
Approvisionnements et Services Canada

Provisional Standard for: Chemical Agent, CS

This provisional standard applies to commercial grade of CS, chemically known as o-chlorobenzalmalononitrile.

Withdrawn/Retired

136-GP-2P

May 1975

Price Code A

Pour l'édition française commander (F)136-GP-2P

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

The CANADIAN GOVERNMENT SPECIFICATIONS BOARD under whose auspices this standard has been developed is a federal government agency engaged in the production of voluntary standards in a wide range of subject areas through the medium of technical committees and the consensus process. The technical committees are representative of relevant interests including producers, consumers and other users, retailers, governments, educational institutions, technical, professional and trade societies, and research and testing organizations. The CGSB has been accredited by the Standards Council of Canada as a national standards writing organization. The standards that it develops and offers as National Standards of Canada conform to the criteria and procedures established for this purpose by the Standards Council of Canada. In addition to standards it publishes as National Standards, CGSB produces standards to meet particular needs, in response to requests from a variety of sources in both the public and private sectors.

Although the intended primary application of each standard is stated in its Definition or Scope clause, it is important to note that it remains the responsibility of the user of the standard to judge its suitability for his particular purpose.

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An up-to-date listing of CGSB standards, including details on latest issues and amendments, and ordering instructions, will be found in the Catalogue of Standards which is published annually with cumulative supplements, and is available without charge upon request.

Further information on the CGSB and its services and standards may be obtained from:

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

Withdrawn/Retired

CANADIAN GOVERNMENT SPECIFICATIONS BOARD

Provisional Standard
for

CHEMICAL AGENT, CS

1. DEFINITION

1.1 This provisional standard applies to a commercial grade of CS, chemically known as 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)

D 1193 Specification for Reagent Water
E 29 Recommended Practice for Indicating which Places of Figures Are to be Considered Significant in Specified Limiting Values
E 300 Recommended Practice for Sampling Industrial Chemicals.

2.1.2 Canadian Transport Commission (CTC)

Regulations for the Transportation of Dangerous Commodities by Rail

2.1.3 US Department of Transport (DOT)

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: The CS shall comply with the detail requirements below, *the limits of which are absolute, and not subject to correction for tolerances of test methods (par. 5.4).*

		Min	Max	Test Method
3.1	CS content, % by wt	96.0	-	5.3.2
3.2	o-Chlorobenzaldehyde, % by wt	-	1.0	5.3.3
3.3	Malononitrile, % by wt	-	1.0	5.3.4
3.4	Volatile matter, % by wt	-	1.0	5.3.5

3.5 Melting Characteristics - The CS shall begin to melt at no less than 93.0°C and shall be completely melted at no greater than 96.5°C.

Par. 5.3.6

4. PREPARATION FOR DELIVERY

4.1 Packaging - The CS shall be packaged in quantities of 20 pounds ± 2 ounces in heat sealable polyethylene bags. The film thickness shall be not less than 0.006 inches and preservative shall not be used. Bags shall not show evidence of leakage when squeezed gently under water or when squeezed gently when seams, joints or other areas likely to leak are coated with a bubble supporting film. Each heat-sealed polyethylene bag of CS shall be inserted into a snug-fitting, open mouth, multiwall paper shipping sack and closed by stitching, care being taken during the stitching operation that the inner bag is not damaged or stitched to the outer sack.

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4.2 Packing - Eight sacks of CS, packaged as in par. 4.1 above, shall be packed in accordance with CTC Regulations (or DOT Regulations) in a removable head metal drum conforming to CTC (DOT) specification 5B or 6C. Any void between the sacks and the drum shall be filled with water absorbent type cellulosic cushioning material. No CS shall be present on the outer surfaces of the sacks or on the inner or outer surfaces of the drum.

4.3 Marking - In addition to any special markings required in the purchase documents, unit packages and shipping containers shall be marked in accordance with CTS (or DOT) regulations.

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.

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

5.3.1 *Water and Chemical Quality* - Water used in tests detailed below shall be in accordance with ASTM D 1193 and reagent grade chemicals shall be used throughout the tests. Where applicable, blank determinations shall be run and corrections applied where significant.

5.3.2 *o-chlorobenzalmalononitrile Content* (Note par. 5.3.1)

5.3.2.1 *Ferric Alum Indicator* - Dissolve 225 g of ferric ammonium sulfate and 100 ml of concentrated nitric acid in 1 ℓ of water.

5.3.2.2 *Procedure* - Weigh to the nearest 0.1 mg approximately 0.5 g of the specimen into a 250 ml Erlenmeyer flask and dissolve in 75 ml of absolute methanol. With vigoruous swirling, add 25 ml of sodium cyanide solution (7.35 g of sodium cyanide per litre of water). Allow to stand for 10 to 15 s, add 2 ml of concentrated nitric acid, and swirl to mix. Immediately add 50 ml of silver nitrate solution (18.7 g of silver nitrate per litre of water) and swirl to mix. Filter through a medium pore qualitative filter paper on a Buchner funnel. To the filtrate, add 2.0 ml of ferric alum indicator prepared as specified in par. 5.3.2.1 and titrate with standardized 0.1N potassium thiocyanate solution to a pink end point. Run blank titers daily. Duplicate titers should agree within 0.1 ml. Calculate the percent CS as follows:

$$\text{Percent CS} = \frac{18.8\ (A-B)\ C}{W}$$

Where: A = Volume of potassium thiocyanate solution used to titrate specimen (ml),

B = Volume of potassium thiocyanate solution used to titrate blank (ml),

C = Normality of potassium thiocyanate used, and

W = Weight of specimen (g).

5.3.3 *o-chlorobenzaldehyde Content (Note par. 5.3.1)*

5.3.3.1 *Carbonyl-free Methanol* - To 500 ml of absolute methanol, add 5.0 g of 2,4-dinitrophenylhydrazine and a few drops of concentrated hydrochloric acid. Reflux for 2 h and distill using a Vigreux column. Keep the distillate tightly stoppered. (Carbonyl-free ethanol may be made in the same manner and substituted for the carbonyl-free methanol).

5.3.3.2 *2,4-Dinitrophenylhydrazine Solution* - Prepare a saturated solution by the continuous addition of 2,4-dinitrophenylhydrazine to carbonyl-free methanol prepared as specified in par. 5.3.3.1 until it no longer dissolves. Prepare a fresh solution weekly.

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5.3.3.3 *Potassium Hydroxide Solution* - Prepare a 10% solution of potassium hydroxide in a liquid solution of 80% carbonyl-free methanol prepared as specified in par. 5.3.3.1 and 20% water.

5.3.3.4 *Standard* - Prepare a standard of 20 µg of o-chlorobenzaldehyde, of no less than 98% purity* per ml of carbonyl-free methanol prepared as specified in par. 5.3.3.1. This standard may be prepared by dissolving 100 mg of o-chlorobenzaldehyde in 100 ml of carbonyl-free methanol and diluting a 2 ml aliquot to 100 ml with carbonyl-free methanol.

5.3.3.5 *Procedure* - Weigh 0.100 g of the specimen and dissolve in 50 ml of carbonyl-free methanol prepared as specified in par. 5.3.3.1. Take 1.0 ml of the specimen solution and 1.0 ml of the standard prepared as specified in par. 5.3.3.4 and to each add 1.0 ml of the 2,4-dinitrophenylhydrazine solution prepared as specified in par. 5.3.3.2 and 0.04 ml of concentrated hydrochloric acid. Heat each for 40 min at 50 ± 2°C and then cool to room temperature. To each solution, add 5.0 ml of the potassium hydroxide solution prepared as specified in par. 5.3.3.3 and 1.0 ml of water. Stir each solution and allow to stand for 10 min. Measure the absorbance of each solution at 480 nm on a spectrophotometer. If absorbance of the specimen solution is greater than that of the standard solution, then the concentration of o-chlorobenzaldehyde is greater than 1% by weight. (It may be necessary to concentrate or dilute the standard to fit the sensitivity of the measuring instrument; in such case, the standard and the specimen must be diluted or concentrated in exactly the same manner).

5.3.4 *Malononitrile Content (Note par. 5.3.1)*

5.3.4.1 *Sodium Acetate Solution* - Prepare a 2% solution of sodium acetate in a 1 to 1 liquid solution of absolute ethanol and methyl cellosolve.

5.3.4.2 *2,4,7-Trinitrofluorenone Solution* - Prepare a 0.4% solution of 2,4,7-trinitrofluorenone in chloroform.

5.3.4.3 *Standard* - Prepare a standard of 20 µg of malononitrile of no less than 97% purity* per ml of absolute ethanol. This standard may be prepared by dissolving 100 mg of malononitrile in 100 ml of absolute ethanol and diluting a 2 ml aliquot to 100 ml with absolute ethanol.

5.3.4.4 *Procedure* - Dissolve 0.100 g of the specimen in 50 ml of absolute ethanol. Take 1.0 ml of the specimen solution and 1.0 ml of the standard and to each add 2 ml of absolute ethanol, 1.0 ml of 2,4,7-trinitrofluorenone solution prepared as specified in par. 5.3.4.2, and 1.0 ml of sodium acetate solution prepared as specified in par. 5.3.4.1. Allow to stand for 20 min. Measure the absorbance of each solution at 570 nm on a spectrophotometer. If absorbance of the specimen solution is greater than that of the standard solution, then, the concentration of malononitrile is greater than 1.0% by weight. (It may be necessary to concentrate or dilute the standard to fit the sensitivity of the measuring instrument; in such case, the standard and the specimen must be diluted or concentrated in exactly the same manner).

5.3.5 *Volatile Matter*

5.3.5.1 *Apparatus* - Determine volatile matter on a moisture balance type apparatus with an infra-red lamp source, with the lamp being the reflector type and rated at 125 watts and 115 to 125 volts.

5.3.5.2 *Procedure* - Place an amount of specimen (based on the amount recommended for the apparatus being used) into the apparatus and set the voltage regulator to 60 V. Read every 15 min until a constant value is obtained.

5.3.6 *Melting Point*

5.3.6.1 *Apparatus*

(a) *Bath* - The bath shall consist of a 1 to 2 ℓ beaker that is about three fourths full of suitable oil. It shall be equipped with a mechanical stirrer and a source of heat that can be easily regulated.

(b) *Capillary Tubes* - Thin walled capillary tubes of uniform diameter shall be long enough to extend to the top of the bath.

(c) *Thermometer* - Accurately standardized total immersion Celsius thermometer.

* Eastman white label material has been found satisfactory as analytical standard.

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5.3.6.2 *Sample Specimen*

(a) The specimen shall consist of a portion of the sample (not exceeding 5 g) ground to pass through a 100 mesh sieve and then dried in an oven at a temperature below its approximate melting point.

5.3.6.3 *Procedure*

(a) Fill the capillary tube with the oven dried specimen to a depth of approximately 4 mm. Compact the sample by tapping. Fasten the tube to the standardized thermometer so that the lower end of the tube is in contact with the bulb of the thermometer. Suspend the thermometer and capillary tube in the bath so that the bulb is at least 40 mm from the bottom of the bath. Suspend an auxiliary thermometer about 10 to 15 mm from the first thermometer, with its bulb approximately at the height of the middle of the exposed mercury column of the first thermometer. Start the stirrer and heat the bath rapidly to within 5°C of the melting point, and then gradually so that the rise in temperature is not less than 1°C every 3 min or more than 1°C per min.

(b) The melting point is recorded as follows:

(i) For materials that melt sharply consider the melting point to be the temperature of which the meniscus of melted specimen first appears across the capillary tube.

(ii) For materials that do not melt sharply, consider the melting point to be the temperature at which the specimen first gives evidence of movement in the capillary, exclusive of shrivelling.

(iii) For materials that melt over a certain temperature range, two temperatures must be recorded. The temperature at which any portion of the specimen collapses against the side of the capillary tube, as indicated when the line representing the inner wall of the capillary tubes become indistinct, is considered the beginning of the melting range. The end of the melting range is considered the temperature at which the last crystal disappears and the specimen is completely liquified.

(c) If the mercury column is completely immersed at the observed melting point temperature, this temperature is reported, with thermometer calibration corrections applied, as the melting point of the sample. If part of the column is exposed, the following correction is added to the observed temperature.

$$\text{Correction} = 0.000\,159\ n\ (T - t)$$

Where:

n = number of degrees in the exposed mercury column, in °C

T = uncorrected melting point, in °C

t = average temperature of the exposed mercury column, in °C.

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 - Purchase documents for CS should specify the following:

(a) Title, number and date of this standard
(b) Quantity required
(c) Special marking, if any, required (par. 4.3)

Withdrawn/Retired

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

6.3 Precaution - CS 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 Information Canada, 171 Slater Street, Ottawa, Ont. K1A OS9. For interpretation consult the Canadian Transport Commission, 275 Slater Street, Ottawa, Ont. K1A ON9.

6.6 The publication listed in par. 2.1.3 may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402. Orders should cite "49 CFR 171-179".

6.7 Acknowledgement - This provisional standard is technically similar to U.S. Military Specification MIL-C-51029B and acknowledgement is made of assistance received from this source.

Withdrawn/Retiree

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