JAN-C-263
28 SEPTEMBER 1945

JOINT ARMY-NAVY SPECIFICATION

CALCIUM STEARATE

Army Number
50–11–133

Navy Number
51C57

This specification was approved by the War Department and the Navy Department for use of procurement services of the Army and the Navy.

A. APPLICABLE SPECIFICATIONS

A–1. The following specifications of the issue in effect on date of invitation for bids, form a part of this specification:

U. S. ARMY SPECIFICATIONS

50–0–1—General Specification for Ammunition except Small Arms Ammunition.
100–2—Standard Specification for Marking Shipments by Contractors.

NAVY DEPARTMENT SPECIFICATION

General Specifications for Inspection of Material.[2]

FEDERAL SPECIFICATION

RR–S–366—Sieves; Standard, Testing.

B. GRADE

B–1. This specification covers one grade of calcium stearate as hereinafter specified.

C. MATERIAL AND WORKMANSHIP

C–1. See section E.

D. GENERAL REQUIREMENTS

D–1. See section E.

E. DETAIL REQUIREMENTS

E–1. *Moisture.*—Maximum, 8.0 percent.
E–2. *Melting point.*—Minimum, 150° C.
E–3. *Water-soluble salts.*—Maximum, 0.25 percent.
E–4. *Calcium content.*—9.2 ±0.2 percent.
E–5. *Acidity or alkalinity.*—Maximum, 0.01 percent.
E–6. *Grit.*—None.
E–7. *Granulation.*—Calcium stearate shall conform to the following granulation requirements using U. S. standard sieves conforming to the requirements of Federal Specification RR–S–366:

[1] Applicable only to Army purchases.
[2] Applicable only to Navy purchases.

	Percent, minimum
Through No. 100 sieve	98
Through No. 200 sieve	95

F. METHODS OF SAMPLING, INSPECTION AND TESTS

F–1. *Size of lots.*—Maximum, 50,000 pounds.

F–2. *Sampling.*—A minimum of 10 percent of the containers in the lot shall be selected by the Government inspector in such a manner as to be representative of the lot. When lots comprise less than 100 containers, either 10 containers or all containers in the lot shall be selected. Sufficient of the material to form a primary sample of approximately one-half pound shall be removed from each selected container by means of a scoop. The samples shall be mixed thoroughly. A 4-ounce portion of each primary sample shall be placed in a rubber-stoppered bottle and labeled so that the container from which it was taken can be easily identified. The remaining portions of the primary samples shall be mixed together thoroughly and quartered until a composite sample of approximately 1 pound is obtained. The composite sample shall be placed in a rubber-stoppered bottle and labeled to show the name of the material, manufacturer, plant, contract or order number, number of pounds in the lot, and lot number. All acceptance tests shall be made on the composite sample representative of the lot. The primary samples shall be held for possible future examination should the composite sample fail to meet the requirements of this specification.

F–3. *Inspection.*—

F–3a. *Army.*—Inspection shall be made in accordance with the requirements of U. S. Army Specification 50–0–1.

F–3b. *Navy.*—Inspection shall be at the point of delivery unless otherwise specified in the contract or order.

F–4. *Tests.*—The laboratory tests shall be made in accordance with the following paragraphs. For Navy purchases, the tests shall be made at a Government laboratory unless otherwise specified in the contract or order:

F–4a. *Moisture.*—Transfer a weighed portion of approximately 2 gm. of the sample to a tared, glass weighing dish. Dry the dish and contents at 100° to 105° C. for 2 hours, cool in desiccator and weigh. Calculate the loss in weight as percentage of moisture in the sample.

F–4b. *Melting point.*—

F–4b (1). *Apparatus.*—Set up a melting point bath equipped with a mechanical stirrer and a source of heat that can be easily regulated. A beaker of 1 to 2 liters capacity about three-fourths full of clear cottonseed oil is suitable. Suspend an accurately standardized total immersion centigrade thermometer in the bath so that the bulb is not less than 1½ inches from the bottom of the bath. If the mercury column will not be completely immersed at the temperature of the observed melting point, suspend a second thermometer about one-half inch from the first thermometer with its bulb at the height of the middle of the exposed mercury column of the first thermometer.

F–4b (2) *Procedure.*—Use thin-walled capillary tubes of uniform diameter, long enough to extend above the top of the bath. Fill the tube with calcium stearate to a depth of approximately 4 mm, compact by tapping, and fasten the tube to the standardized thermometer so that the lower end of the tube is in contact with the bulb of the thermometer. Start the stirrer, heat the bath rapidly to about 140° C.,

and then gradually so that the rise in temperature does not exceed 1 degree in 1 minute. Record the temperature observed at the instant the first meniscus of melted material appears across the capillary tube.

F–4b (3). *Report.*—If the mercury column is completely immersed at the above temperature, report this temperature as the melting point of the sample. If part of the column is exposed, add the following correction to the observed melting point:

$$n\ (T-t) \times 0.00016$$

where

n=number of degrees in the exposed column.
T=uncorrected melting point.
t=average temperature of exposed column.

F–4c. *Water-soluble salts.*—Transfer a weighed portion of approximately 2 gm. of the sample to a 25-ml. beaker. Add 10 ml. of 95-percent ethyl alcohol, and stir the mixture until a fine paste is formed. Add 100 ml. of hot water to the mixture, bring to the boiling point, and allow to boil for one-half hour, stirring frequently. Filter the solution through a Buchner type funnel, and wash the beaker several times with hot water, passing the washings through the funnel. Transfer the combined filtrate and washings to a tared platinum dish, evaporate the solution to dryness, and ignite the residue. Cool the dish and contents in a desiccator and weigh. Calculate the increase in weight of the dish as percentage of water-soluble salts in the sample on a moisture-free basis.

F–4d. *Calcium.*—Transfer a weighed portion of approximately 2 gm. of sample to a platinum dish. Ignite the sample and dissolve the ash in 10 ml. of 10-percent hydrochloric acid solution. Dilute the solution with water to a volume of approximately 100 ml., make the solution just ammoniacal to methyl red indicator with ammonium hydroxide, and then add 1 to 2 ml. of ammonium hydroxide in excess. Pass H_2S gas through the solution for approximately 15 minutes. Filter the solution through filter paper, and wash any precipitate with ammonium sulfide solution prepared by diluting 2 ml. of ammonium hydroxide to a volume of 100 ml. with water and saturating with H_2S gas. Heat the combined filtrate and washings to the boiling point, and allow to boil to remove volatile sulfides. Add bromine water in excess, and allow the solution to boil to remove the excess. Add 25 ml. of a saturated solution of ammonium oxalate, make the solution slightly ammoniacal, and then heat at a temperature near the boiling point for 1 hour. Filter the solution through filter paper, and wash the precipitate with hot water. Ignite the filter paper and precipitate to constant weight in a tared crucible, cool in a desiccator and weigh. Calculate the increase in weight as percentage of calcium oxide in the sample on a moisture-free basis.

F–4e. *Acidity or alkalinity.*—Emulsify a 5-gm. portion of the sample with 50 ml. of petroleum ether and transfer the emulsion to a separatory funnel. Add 100 ml. of distilled water and shake thoroughly. Allow the water to separate and transfer it to a beaker. Add a few drops of phenolphthalein indicator and note if mineral alkalinity is absent as indicated by failure of the solution to turn pink. If the solution is not alkaline, add a few drops of methyl red indicator and note if mineral acidity is absent as indicated by the solution turning yellow in color. If the presence of mineral alkalinity or acidity is indicated, titrate the solution with approximately N/10 acid or al

kali and calculate to percentage of calcium hydroxide or sulfuric acid in the sample.

F–4f. *Grit.*—Transfer a 5-gm. portion of the sample to a platinum dish and heat until nearly all the carbonaceous matter is consumed. Add 10 ml. of 20-percent hydrochloric acid solution and heat gently. Dilute the solution with distilled water and filter, transferring the residue to the filter paper. Wash the residue with hot water. Dry the filter paper and heat in the platinum dish until all carbonaceous matter is consumed. Transfer the residue to a smooth glass slide and rub on the glass by exerting pressure with a smooth steel spatula blade. Note if particles of grit are present as indicated by lack of uniformity of the material and the persistence of a scratching noise when pressing and rubbing of the material on the glass plate is continued.

F–4g. *Granulation.*—Superimpose a tared U. S. standard No. 100 sieve on a tared U. S. standard sieve No. 200. Place a 10-gm. portion of the sample in a beaker and wet thoroughly with water containing a wetting agent. Transfer the mixture to the No. 100 sieve and wash with water until no more material passes through the sieve. Remove the No. 100 sieve and wash any material held on the No. 200 sieve until no more material passes through it. Dry the sieves at 100° to 105° C., cool, and weigh. From the weights of material held on the sieves, calculate the percentages of the sample passing through each sieve.

F–5. *Resubmission.*—If the composite sample representative of the lot fails to pass the inspection tests, the manufacturer shall have the option of having analysis of each primary sample made at no further expense to the Government. The manufacturer may then remove or replace defective portions of the lot represented by the primary samples which fail to meet the requirements and submit the lot for acceptance, provided that the markings on the container are such that complete removal or replacement of defective portions of the lot can be made to the satisfaction of the Government inspector.

G. PACKAGING, PACKING, AND MARKING FOR SHIPMENT

G–1. *Packing.*—Unless otherwise specified in the contract or order, calcium stearate shall be packed in commercial barrels or drums so constructed as to insure acceptance by common or other carriers, for safe transportation, at the lowest rate, to the point of delivery.

G–2. *Marking.*—In addition to any special marking required by the contract or order, shipments for the Army shall be marked in accordance with the requirements of the U. S. Army Specification 100–2; for the Navy, in accordance with the requirements of the latest issue of the Navy Shipment Marking Handbook.

H. NOTES

H–1. Requests, requisitions, schedules, and contracts or orders should contain the title of the specification, the number, and date.

H–2. *Use.*—Calcium stearate covered by this specification is intended for use as a binder and lubricant in the pelleting of explosives.

H–3. *Army.*—This specification replaces Picatinny Arsenal Tentative Specification PXS–1079.

H–4. Copies of Joint Army-Navy specifications and Federal specifications (required for Army purchases) and U. S. Army specifications may be obtained as indicated in the "Index of United States Army, Joint Army-Navy, and Federal Specifications Used by the War

Department." Copies of this Index may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Agencies within the War Department will obtain copies of Joint Army-Navy; United States Army and Federal specifications through established War Department channels. Both the title and identifying symbol number should be stipulated when requesting copies of specifications.

H–5. Copies of Joint Army-Navy specifications and Federal specifications (required for Navy purchases), Navy Department specifications, and Navy Shipment Marking Handbook may be obtained upon application to the Bureau of Supplies and Accounts, Navy Department, Washington 25, D. C., except that Naval activities should make application to the Supply Officer in Command, Naval Supply Depot, Bayonne, N. J. Both the title and identifying symbol number should be stipulated when requesting copies of specifications.

H–6. Copies of this Joint Army-Navy specification (required for Army purchases) may be obtained from the Office, Chief of Ordnance, Army Service Forces, Washington 25, D. C.

H–7. Copies of this Joint Army-Navy specification (required for Navy purchases) may be obtained as indicated in paragraph H–5.

NAVY: OS.

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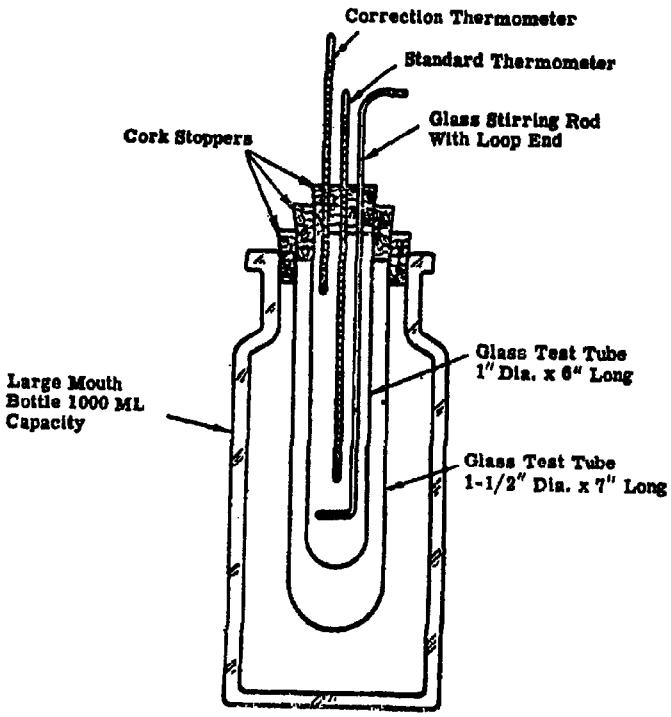

FIGURE 1.—Solidification point apparatus.

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