MIL-I-17276A (OS)
30 October 1971
SUPERSEDING
MIL-I-17276
19 June 1962

MILITARY SPECIFICATION

INHIBITORS, CELLULOSE ACETATE, EXTRUDED

This specification has been approved by the Naval Ordnance Systems Command, Department of the Navy.

1. SCOPE

1.1 Classification. Inhibitors shall be of the following composition, as specified:

Composition - Cellulose acetate prepared from chemical cellulose (reference ASTM subcommittee 1 under D-23) and plasticized with dimethyl phthalate. The composition shall be 26 to 30 parts of plasticizer per 100 parts of cellulose acetate flake.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, standards, and publications, of the issue in effect on date of invitation for bids, form a part of this specification:

SPECIFICATIONS

Federal

L-P-406	Plastics, Organic: General Specifications, Test Methods

Navy Department

General Specifications for Inspection of Material

STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage

FSC 9330

DRAWINGS

The applicable drawings in effect on the date of invitation for bids form a part of this specification.

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

2.2 Other publications. The following publications, of the issue in effect on date of invitation for bids, unless otherwise stated, form a part of this specification:

AMERICAN SOCIETY FOR TESTING MATERIALS

ASTM Method D871-63, - "Standard Methods of Testing Cellulose Acetate."

(Copies of ASTM publications may be obtained from the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.)

3. REQUIREMENTS

3.1 Materials. The inhibitors shall be manufactured from a transparent cellulose acetate composition containing only cellulose acetate and plasticizer as specified in accordance with 1.1. No dye or other foreign material shall be added. The cellulose acetate shall be manufactured from chemical cellulose and plasticizer and it shall be equivalent to Compound A-2120-41BE-2R300 supplied by Eastman Chemical Products Incorporated.

3.2 Method of manufacture. The inhibitors shall be made by the continuous extrusion method.

3.3 Dimensions. The dimensions of the inhibitors shall comply with the applicable drawings.

3.4 Physical and chemical requirements.

3.4.1 Appearance. The inhibitors shall contain no bubbles, blisters or foreign materials which are discernible by the visual inspection described in 4.4.2. They shall also be entirely free from die lubricant or any other coating which may affect their serviceability.

3.4.2 Impact. The inhibitors shall have an average impact value between 2.3 and 3.7 foot pounds per inch of notch as measured by the modified Izod impact test described in 4.4.3. Individual samples shall have a minimum impact value of 1.5 foot pounds per inch of notch.

3.4.3 Viscosity. The viscosity of the cellulose acetate, when tested in accordance with 4.4.4, shall be between 30 and 50 seconds.

3.4.4 Chemical identification. The inhibitor shall contain only cellulose acetate and dimethyl phthalate as specified in 1.1 when tested in accordance with 4.4.5.

3.4.5 Plasticizer level. The sample inhibitors shall have a minimum of 26 percent and a maximum of 30 percent plasticizer when tested in accordance with 4.4.6.

3.4.6 Acetyl content. The average acetyl content shall be between 37.2 and 37.9 percent when tested in accordance with 4.4.7.

3.5 Workmanship. The workmanship shall be first class in every respect and conform to the best commercial practice.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Sampling.

4.2.1 Lots.

4.2.1.1 Pilot lot. The successful bidder shall be required to produce a pilot lot of extruded inhibitors at the plant in which he is to fulfill his contract, from the same materials and by the same processes that he proposes to follow in executing the contract. The pilot lot shall consist of the first lot of a single composition of inhibitors submitted for acceptance, and shall be between 40 and 50 inhibitors. Unless otherwise specified, no inhibitors shall be accepted as a production lot until the pilot lot has been tested and found to conform to this specification.

4.2.1.2 Production lot. Unless otherwise specified, a production lot shall consist of a single composition of inhibitors. The inhibitor lot shall be produced from a single lot of molding powder or may be an individual shipment of inhibitors from a single lot of molding powder, whichever is smaller.

4.2.2 Sampling for dimensional acceptance tests. Unless otherwise specified herein, samples for dimensional and visual inspection shall be selected at random from the lot in accordance with MIL-STD-105.

4.2.3 Sampling for chemical tests. Samples for chemical tests shall be taken from the samples used for the physical tests in 4.2.4

4.2.4 Sampling for physical tests. Samples for physical tests shall be selected at random in accordance with the following table:

Lot Size	Sample Size	Allowable Defect Number
1-50	3	0
51-1000	4	0
1001-2000	8	1

4.2.5 Rejection. Unless otherwise specified, a lot shall be rejected if samples taken in accordance with 4.1 fail to meet the minimum requirements specified in 3.4.

4.3 Inspection. For Naval purchases, the general inspection procedures shall be in accordance with General Specifications for Inspection of Material.

4.4 Test procedures.

4.4.1 Pilot lot. The pilot lot shall be inspected and tested to determine compliance with applicable drawings and requirements of Section 3.

4.4.2 Appearance. To examine the inhibitor for the presence of bubbles, blisters or foreign materials, place the inhibitor between a concentrated light source and a white opaque screen whose size exceeds the height and diameter of the inhibitor material under investigation. Position the light source approximately 12 inches from the surface of the inhibitor opposite the screen. Maneuver the screen until the image of the inhibitor adjacent to the screen is in focus. Rotate the inhibitor past the light source so that the entire area of the inhibitor is examined. Any bubbles or blisters will appear as white spots in the projected image on the screen, while foreign material will appear as dark areas.

4.4.3 Impact test. This test shall be in accordance with Method 1071 of Specification L-P-406, with the following exceptions and modifications:

Two rings, each 1/2 inch in width, shall be cut from the sample inhibitor. One ring shall be cut into specimens approximately 2-1/2 inches by 1/2 inch by the thickness of the inhibitor. The second ring shall be cut in the same manner, except that the ring shall be rotated before cutting so that the cuts in the second ring fall in the center of the corresponding pieces cut from the first ring. The pieces are then notched on the narrower side of the test specimen. The thickness of the specimens shall be measured with a micrometer. Specimens shall be conditioned for 24 hours at 25°C., before testing. The tests shall be carried out at 25°C. The specimen shall be clamped into position so that the blow is struck on the notched side. A minimum of five equally spaced specimens from each ring shall be tested.

4.4.4 Viscosity. The viscosity of the cellulose acetate shall be determined in accordance with ASTM Method D871-63, Formula B, with the following modifications and exceptions:

The cellulose acetate used in this determination shall consist of plasticized material taken from the test inhibitor. The plasticizer present in the sample shall be considered a part of the solvent in the four to one ratio of solvent to cellulose acetate. The remainder of the solvent shall be acetone.

4.4.5 Chemical identification. The inhibitor material shall be determined by infrared spectroscopy to contain only cellulose acetate and dimethyl phthalate.

4.4.6 Plasticizer level. The total plasticizer present in the inhibitor shall be determined by an extraction as follows:

The plastic is cut into thin strips and ground in a Wiley or similar mill to pass a No. 20 sieve. The determination shall be made in duplicate. About five grams of the ground plastic is extracted in a glass Soxhlet apparatus for 20 hours or longer, using approximately 150 milliliters of a one to one mixture of Formula 2-B alcohol and technical grade n-hexane. Adjust the heat so that the solvent drips off the end of the condenser at the rate of two to three drops per second. After extracting for 20 hours or more, disconnect the flask and evaporate the solvent to a volume of about five milliliters on a steam bath, using a current of dry air. Do not evaporate to dryness. Place the flask in a vacuum desiccator that contains no drying agent, and evacuate for 30 minutes or longer using a water aspirator. Connect the desiccator to an oil pump and evacuate for two hours at one to two millimeters pressure. Weigh the flask, return it to the desiccator and evacuate for an additional hour. The flasks are considered to have come to constant weight when the difference between successive weighings is 0.002 gram or less. The plasticizer level is calculated as follows:

$$\text{Percent Plasticizer} = \frac{\text{Wt. of Extracted Material X 100}}{\text{Wt. of Sample}}$$

Duplicates shall check within one percent as to percent Plasticizer.

4.4.7 Acetyl content. The average acetyl content shall be determined in accordance with ASTM Method D871-63, using the residue from 4.4.6 as the sample.

5. PREPARATION FOR DELIVERY

5.1 Packaging. When inhibitors of various diameters are nested one inside the other, they shall be protected by wrapping or by suitable spacers so as to insure safe delivery in accordance with 5.2.

5.2 Packing. The inhibitors shall be packed for shipment by wrapping with heavy paper, enclosing them in cardboard tubes, or in any other manner that will insure safe arrival at their destination free from scratches, holes, cracks, marks, or any other defects which may affect their serviceability. The ends of the inhibitors shall be protected by heavy paper or cardboard closures.

5.3 Marking. In addition to any special marking required by the contract or order, shipments shall be marked in accordance with MIL-STD-129. When inhibitors are nested one inside the other in accordance with 5.1, the exterior package shall show the number and sizes of the inhibitors contained within. Shipments must be identified by molding powder lot number. In the event that mixed lots occur in one shipment, individual inhibitors must be marked as to molding powder lot.

6. NOTES

6.1 Manufacture by Government Activities. When equipment is to be designed or manufactured in accordance with this specification by Government Activities, the requirements given herein for bidders and contractors shall apply to such Government Activities.

Preparing Activity
Navy - OS
(Project No. 9330-N539)

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 22-R255

INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.

SPECIFICATION

ORGANIZATION

CITY AND STATE

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO *(If "yes", in what way?)*

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity - Optional)*

DATE

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REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.

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