

MIL-I-3166A(OS)

5 January 1976

SUPERSEDING

MIL-I-3166

31 March 1950

## MILITARY SPECIFICATION

## INHIBITORS, WEB AND END (PLASTIC)

This specification is approved for use by all departments and agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers ethyl cellulose and cellulose acetate molded plastic inhibitors. (See 6.1.)

\* 1.2 Classification. The inhibitors furnished under this specification shall be of the following types, and classes, as specified (See 6.2.):

Type I - Web inhibitors

Type II - End inhibitors

Class 1 - Ethyl cellulose

Class 2 - Cellulose acetate

## \* 2. APPLICABLE DOCUMENTS

2.1 The following documents of the issues in effect on date of invitation for bids or request for proposals form a part of this specification to the extent specified herein. In the event of conflict between this specification and any document referenced herein, requirements of this specification shall apply.

## SPECIFICATIONS

Federal

* NN-P-508	Plywood, Flat Panel
* PPP-B-601	Box, Wood, Cleated Plywood
* PPP-B-621	Box, Wood, Nailed and Lock-Corner

FSC 9330

MIL-I-3166A(OS)

Military

MIL-M-3165 Molding Compounds (For Plastic Inhibitors)  
 MIL-M-3167 Adhesives (For Plastic Inhibitors)

## STANDARDS

Military

\* MIL-STD-129 Marking for Shipment and Storage

## DRAWINGS

\* Naval Sea Systems Command (Code Ident 10001)

446714 Long Web Inhibitor  
 446715 Short Web Inhibitor  
 451264 End Inhibitor  
 451269 End Inhibitor

\* (Copies of specification, standards, and drawings required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

## 3. REQUIREMENTS

3.1 Pilot lot. The successful bidder shall be required to produce a pilot lot of inhibitors at the plant in which he is to fill his contract, from the same materials and by the same processes that he proposes to follow in executing the contract.

3.2 Molding compounds. As specified in the contract or order the inhibitors shall be molded from ethyl cellulose or cellulose acetate complying with MIL-M-3165 (See 6.2). The contractor shall furnish the procuring agency the name of the manufacturer, the contract number and the lot number under which the molding compound was accepted under pilot lot tests for use in molding inhibitors, by the Government. Contractors may submit pilot lot samples, for test of the molding compound to be used, at the same time as sample of inhibitors is submitted for test under this specification.

3.3 Method of molding. Type I inhibitors shall be extrusion molded and type II inhibitors shall be injection molded.

\* 3.4 Design and tolerances. The design of the inhibitors shall comply with Drawings 446714, 446715, 451264, or 451269 as applicable.

MIL-M-3165A(OS)

- 3.5 Appearance. The inhibitors shall be smooth and as free from bubbles and foreign matter or any contamination as is consistent with good commercial practice. They shall also be free from flash, and gates shall be trimmed flush with adjacent surfaces.
- 3.6 Transparency. The transparency shall be such that the cruciform powder grain can be clearly seen when the inhibitors are adhered to the grain.
- 3.7 Marking individual inhibitors.
- 3.7.1 Placement and arrangement. The marking shall be placed on the inhibitors in accordance with the applicable drawing, and the arrangement shall be in the following order: The drawing number with revision letter, where applicable, molder's symbol, lot number, and class designation.
- 3.7.2 Manner of application. The markings shall be applied on type I inhibitors by rubber stamp or hot die, and on type II with rubber stamp, etched-in-die, or depressed panel-in-die.
- 3.8 Adhesion of inhibitors to double-base powder grain. Web inhibitors extruded from the class of compound specified (See 6.2) shall adhere properly to a cruciform-shape double-base powder grain when tested as specified in 4.4.1.3.
- 3.9 Dimensional stability.
- 3.9.1 Type I inhibitors. After heating for 24 hours at 140°F. a 4 3/4 - inch length of the inhibitor shall not warp in excess of 0.050 inch and any change in length or width shall be less than 2 percent.
- 3.9.2 Type II inhibitors. After heating for 24 hours at 140°F, the inhibitors shall not warp in excess of 0.030 inch, and any change in length or width shall be less than 2 percent.
- 3.10 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.

MIL-I-3166A(OS)

4.2 Lot

4.2.1 Production lot. Unless otherwise specified, a production lot shall consist of a single type, class, and composition of inhibitors produced in a production run according to one set of drawings and prepared as an individual shipment.

4.3 Sampling

- \* 4.3.1 Sampling for pilot lot acceptance tests. Samples from the pilot lot (See 3.1) shall consist of 80 inhibitors of the same type and class and covered by the same drawing number. The samples shall be securely packed for shipment to the Government laboratory designated by the procuring activity and marked with the following:

Samples for pilot lot acceptance tests in accordance with MIL-I-3166  
 Name of manufacturer  
 Manufacturer's designation  
 Authorized by (reference letter or contract number)

- \* 4.3.2 Sampling for production lot acceptance tests. Unless otherwise approved, no web or end inhibitors shall be accepted as a production lot until the pilot lot has been tested and found to conform to this specification. Thirteen inhibitors shall be selected for tests as specified in 4.5.

4.4 Tests.

4.4.1 Pilot lot tests. The pilot lot acceptance test shall determine that all requirements of all applicable drawings have been met satisfactorily and, in addition shall consist of all of the tests of this specification and such other tests considered necessary by the procuring activity.

4.4.1.1 Color. When colored inhibitors are specified, the color shall be determined by visual comparison with the color sample submitted with the contract or order.

4.4.1.2 Dimensional stability.

4.4.1.2.1 Type I inhibitors. File both ends of 75 inhibitors selected as specified in 4.3.1 to approximately 4 3/4 inches in length, plane, smooth, and at right angles to their longitudinal axis. Drill a 1/16-inch hole through each inhibitor midway of the sides and 3/8 inch from the end. Measure the length and width of each specimen to the nearest 0.001 inch, care being taken to identify the measurements with the individual specimen. Suspend each specimen by means of a wire hook in a well-ventilated oven maintained at 140° ± 2°F, for 24 hours, remove, and allow to cool for 1 hour at room temperature, 77° ± 2°F. Place the

MIL-I-3166A(OS)

specimens on a surface plate (plate glass will suffice in the absence of a surface plate), and by means of a feeler gage, measure the distortion of the specimens. The distortion of the specimens shall not exceed 0.050 inch at any point of measurement. Any change in length or width shall be less than 2 percent. The lot will be acceptable if no more than seven specimens in the sample fail to conform to the dimensional stability tests specified herein; unless otherwise specified, if eight or more specimens fail to conform the lot shall be rejected.

4.4.1.2.2 Type II inhibitors. On one of the cross arms of each of 75 inhibitors selected as specified in 4.3.1, drill a 1/16-inch hole midway between the sides and 3/8 inch from the end. Measure the over-all length and width of the cross arm of each specimen to the nearest 0.001 inch, care being taken to identify the measurements with the individual specimen. Suspend each specimen, by means of wire hook, in a well-ventilated oven maintained at  $140^{\circ} \pm 2^{\circ}\text{F}$  for 24 hours, remove, and allow to cool for 1 hour to room temperature,  $77^{\circ} \pm 2^{\circ}\text{F}$ . Place the specimens on a surface plate (plate glass will suffice in the absence of a surface plate), and by means of a feeler gage, measure the distortion along all of the edges while holding the specimens lightly at their center points. The distortion of the specimens shall not exceed 0.030 inch at any point of measurement. Any change in length or width shall be less than 2 percent. The lot will be acceptable if no more than seven specimens in the sample fail to conform to the dimensional stability tests specified herein; unless otherwise approved, if eight or more specimens fail to conform, the lot shall be rejected.

4.4.1.3 Adhesion to double-base powder grain. The adhesion of inhibitors covered by this specification shall be determined by the adhesion of type I inhibitor only. The adhesion of each of four inhibitors (See 4.2) to the double-base cruciform powder grain by use of an adhesive conforming to MIL-A-3167 shall be tested. For comparison two type I inhibitors of the same size that have previously been tested and approved under this specification shall be adhered to the same cruciform powder grain with the same adhesive. The assembly shall be conditioned for 24 hours at room temperature,  $77^{\circ} \pm 2^{\circ}\text{F}$  and stored for 72 hours at  $130^{\circ} \pm 10^{\circ}\text{F}$ , and cooled to room temperature. All of the inhibitors shall then be pulled from the grain with a prescribed pulling tool. Unless otherwise approved the lot shall be rejected if the adhesion of the inhibitors of the lot is in any manner inferior to the adhesion of the approved inhibitors used for comparison.

4.5 Production lot tests. Production lots shall be tested to determine dimensional stability in accordance with 4.4.1.2.

4.6 Resubmission. A lot that has been rejected under the provisions of this specification may be resubmitted for inspection and testing, provided the contractor (after being informed of the reasons for rejection)

MIL-I-3166A(OS)

has suitably reworked the entire lot and submits a signed statement that he has corrected the deficiencies noted. When resubmitted for inspection and testing, the lot shall be sampled in accordance with 4.3.1 and tested in accordance with 4.4.1.

## 5. PREPARATION FOR DELIVERY

\* 5.1 Packaging. The number of inhibitors called for in table I shall be stacked, or nested, and secured in accordance with acceptable commercial practices. Blocks, 3/4 inch thick, hard wood, cut to the width and length of the inhibitors, and shaped on one side to conform to the shape of the mating inhibitor, shall be secured to the top and bottom of the web inhibitors. Blocks for end inhibitors shall be made from 3/4-inch plywood conforming to moisture-resistant type, industrial grade of NN-P-508. The stacks shall be secured with two flat steel strips 1/4 inch by 0.010 inch, or equivalent round, steel wire.

TABLE I

NUMBER OF END AND WEB INHIBITORS PER UNIT PACKAGE.

Inhibitor description		Number per stack	Number per box
Front inhibitors, all- - - -		50	1,500
Rear inhibitors, all sizes - -		20	800
Web inhibitors:	Grain mark:		
Short - - - -	18	100	1,000
Long - - - -	18	100	500
Short - - - -	19	50	2,000
Long - - - -	19	100	1,000
Short - - - -	20	50	2,000
Long - - - -	20	100	1,000
Short - - - -	21	50	2,000
Long - - - -	21	100	1,000
Short - - - -	22	50	2,000
Long - - - -	22	100	1,000
Short - - - -	24	50	2,000
Long - - - -	24	100	1,000
Short - - - -	25	50	2,000
Long - - - -	25	100	1,000

## \* 5.2 Packing.

5.2.1 Level C. Bundled inhibitors shall be packed in wood-cleated plywood or nailed wood boxes conforming to PPP-B-601 or PPP-B-621, respectively. The number of inhibitors per box shall be as shown in table I.

MIL-I-3166A(OS)

\* 5.3 Marking. In addition to any special marking required by the contract or order, shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The molded plastic inhibitors covered by this specification are for use in inhibiting cruciform-shape propellant powder-grains.

6.2 Ordering information. Procurement documents should specify the following:

- a. The title, number, and date of this specification.
- b. The type, class, drawing, and piece number of the inhibitor (See 1.2).
- c. The Government laboratory to which sample specified in 4.3.1 is to be sent for testing.

\* 6.3 The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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