MIL-P-81255A
18 February 1976
Superseding
MIL-I-81255(WP)
23 March 1965
and
MIS 13498A
30 June 1972
(See Section 6)

MILITARY SPECIFICATION

PLASTIC MOLDING MATERIAL, ASBESTOS PHENOLIC

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers two classes of asbestos phenolic molding material.

1.2 Classification. The asbestos phenolic molding material shall be of the following classes as specified in the contract or order (See 6.2):

Class 1 - 27 to 33 percent phenolic resin
Class 2 - 38 to 43 percent phenolic resin

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposals form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-P-116	Preservation - Packaging, Methods of
MIL-P-25770	Plastic Materials, Asbestos Base, Phenolic Resin, Low or High Pressure Laminates

STANDARDS

Military

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

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM)

ASTM D 638-72	Tensile Properties of Plastics
ASTM D 695-69	Compressive Properties of Rigid Plastics
ASTM D 731-67	Measuring the Molding Index of Thermosetting Molding Powder
ASTM D 792-66	Specific Gravity and Density of Plastics by Displacement
ASTM D 1918-67	Asbestos Content of Asbestos Textile Materials

(Application for copies should be addressed to the American Society for Testing Materials, 1916 Race Street, Philadelphia, PA 19103)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Preproduction Sample. Unless otherwise specified in the contract or order (see 6.2), a preproduction sample of the molding material is required and shall be manufactured using the methods and procedures proposed for production (See 4.3.1). The sample shall be tested as specified in 4.4 for the purpose of determining, prior to starting production, that the contractor's production methods are capable of producing molding material that complies with the technical requirements of the contract. No raw material or process changes shall be made, subsequent to approval of the preproduction sample, without prior written approval of the procuring activity.

3.2 Material. The plastic molding material shall be a macerated resin-impregnated chrysotile asbestos felt. The phenolic resin shall be in accordance with MIL-P-25770. The asbestos felt shall be not less than 99 percent asbestos in accordance with ASTM D 1918-67.

3.3 Physical and chemical properties.

3.3.1 Molding material properties. The properties of the uncured molding material shall be in accordance with Table I.

3.3.2 Cured molding material properties. The properties of the cured molding material (see 4.4.1), shall be in accordance with Table II.

Table I. Molding Material Properties.

Property	Class 1		Class 2	
	min	max	min	max
Resin content, percent	27	33	33	43
Volatiles content, percent		6	3	12
Flow cup, seconds	15	30	4	20

Table II. Cured Molding Material Properties.

Property	Class 1		Class 2	
	min	max	min	max
Specific gravity	1.71	1.90	1.71	1.85
Tensile strength, psi	6,000		6,000	
Compressive strength, psi parrallel to molding direction	35,000		42,000	
perpendicular to molding direction	14,000		14,000	

3.4 Workmanship. The molding material shall be uniform in quality and shall be free from impurities and other defects that could adversely affect its use.

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, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deem necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of inspections. Inspection of the molding material shall be classified as follows:

a. Preproduction inspection (see 4.4).
b. Quality conformance inspection (see 4.5).

4.3 Sampling.

4.3.1 Preproduction sample. Unless otherwise specified in the contract or order (see 6.2, a preproduction sample of molding material shall be manufactured in accordance with 3.1 and compression molded to form three molded test panels in accordance with 4.4.1. These three molded test panels shall be forwarded to an activity designated by the procuring activity (see 6.2) for preproduction inspection as detailed in 4.4. Further production of the molding material by the contractor, prior to approval of the preproduction sample, shall be at the contractor's risk.

4.3.2 Lot. Unless otherwise specified (see 6.2), a lot shall consist of all molding material manufactured by the same process, from the same raw materials, by one manufacturer, at one plant, in a single production run, under essentially identical conditions, and offered for acceptance at one time.

4.3.3 Quality conformance inspection sampling. Quality conformance inspection samples shall be selected in accordance with inspection level S-4 of MIL-STD-105 from molding material prepared for delivery in accordance with 5.1. The sample unit shall be one unit package or container. Each sample shall consist of a minimum of 80 grams (g) of molding material obtained from filled sample containers, prior to sealing.

4.4 Preproduction inspection. The preproduction sample, after having satisfactorily passed the quality conformance inspection of 4.5, shall be compression molded in accordance with 4.4.1 and subjected to the tests of 4.4.2 through 4.4.5. Failure to meet any requirement of this specification shall be cause for rejection of the preproduction sample.

4.4.1 Preparation of preproduction sample. Preproduction sample molding material shall be compression molded at 4000 ± 100 psi for 30 to 35 minutes at 149 ± 3°C (300 ± 5°F) with a minimum post cure of 24 hours at 149 ± 3°C (300 ± 5°F) to form three test panels. Each molding test panel shall be a minimum of 17 x 23 x 1.3 cm (6.7 x 9.0 x 0.5 in).

4.4.2 Specific gravity. The specific gravity of the cured molding compound shall be determined in accordance with method A-1 of ASTM D 792-66. One test specimen from each test panel of 4.4.1 shall be prepared and tested.

4.4.3 Tensile strength. The tensile strength shall be determined in accordance with ASTM D 638-72, specimen Type I and grip seperation speed B, with the exception that four specimens (two normal to and two parallel with the molding direction) from each test panel of 4.4.1 shall be prepared and tested.

4.4.4 Compressive strength. The compressive strength shall be determined in accordance with ASTM D 695-69, using standard test specimens, with the exception that four specimens (two normal to and two parallel with the molding direction) from each test panel of 4.4.1 shall be prepared and tested.

4.5 Quality conformance inspection. Each sample obtained in accordance with 4.3.3 shall be subjected to the following tests. Failure of any sample to meet any requirement of this specification shall be cause for rejection of the lot. When specified in the contract or order (see 6.2.2), the contractor shall furnish test reports showing quantitative results for all quality conformance tests required by this specification for each lot of material.

4.5.1 Resin content. The resin content shall be determined as follows:

a. Weigh approximately 2g of sample to the nearest 0.001g.
b. Dry the specimen at 163 ± 3°C (325 ± 5°F) until a constant weight is obtained (approximately 15 minutes).
c. Ignite at 815.5 ± 22°C (1500 ± 40°F) for 60 ± 5 minutes.
d. Cool in a desiccator and weigh the ash.
e. Calculate the resin content as follows:

$$\text{Resin content (percent)} = 100 - \frac{W_2 \times 100}{W_1 \times 0.86}$$

where:

W_2 = Weight of ash(g)

W_1 = Weight of dried specimen(g)

0.86 = Correction factor for water of crystallization in chrysotile asbestos.

f. Repeat the procedure for a total of five specimens from each sample and report the average of the five tests.

4.5.2 Volatiles content. The volatiles content shall be determined as follows:

a. Weigh approximately 2g of sample to the nearest 0.001g.
b. Dry the specimen for not less than 15 minutes at 163 ± 3°C (325 ± 5°F) in a circulating-air oven.
c. Cool in a dessiccator and reweigh.

d. Calculate the volatiles content as follows:

$$\text{Volatiles content (percent)} = \frac{W_1}{W_2} \times 100$$

where:

W_1 = Weight loss of specimen (g)

W_2 = Original weight of specimens (g)

e. Repeat the procedure for a total of five 2g specimens from each sample and report the average of the five tests.

4.5.3 Flow cup. The flow cup value shall be determined in accordance with ASTM D 731-67 with the following exceptions:

a. The mold flash thickness shall be .020 inch maximum.
b. A 45 ± 1 g specimen shall be used.
c. For some styles of molding materials, the following procedure must be used: Add 0.5 percent of zinc stearate to test batch and thoroughly mix (in a P-K blender or equivalent) into molding material prior to molding flow cups.
d. Molding specimens shall be formed into a soft ball by hand for ease in loading mold.
e. Mold temperature shall be 146 ± 3°C (295 ± 5°F) with a molding force of 8700 ± 100 pounds and a closing speed of 1 inch per second on an Elm press or equivalent.
f. Molding material shall be conditioned at a temperature of 21 ± 3°C (70 ± 5°F) and a relative humidity of 50 ± 10 percent for 12 hours prior to testing. If this is not possible, allowances must be made in readings. Temperature and humidity shall be recorded at time of test if above conditions cannot be met.
g. Seconds shall be measured by a stop watch from the time initial pressure is exerted on the sample until the instant the mold is closed.
h. Flow shall be in terms of seconds required to close the mold.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging and packing. Unless otherwise specified in the contract or order (see 6.2), minimum requirements for packaging and packing shall be in accordance with MIL-P-116, method III. Container size shall be as specified in the contract or order (see 6.2).

5.2 Marking. In addition to any special marking required by the contract or order (see 6.2), each container shall be marked in accordance with MIL-STD-129. Marking shall include, but not be limited to, the following information:

a. Manufacturer's name and location.

b. Material trade name.
c. Net weight and volume.
d. Lot number, batch number and date of manufacture.
e. Shelf life or storage limitations.
f. Number and date of this specification.

6. NOTES

6.1 Intended use. Plastic molding material in accordance with this specification is intended for use as an insulator in rocket motors.

6.2 Ordering data. Procurement documents should specify the following:

6.2.1 Procurement requirements

a. Title, number and date of this specification
b. Class and quantity required (see 1.2)
c. When a preproduction sample is not required (see 3.1, 4.3.1 and 6.4).
d. Assigned activity for preproduction inspection (see 4.3.1).
e. Lot size if other than as specified (see 4.3.2).
f. Packaging requirements if other than as specified (see 5.1).
g. Size of container required (see 5.1).
h. Any special markings required (see 5.2).

6.2.2 Contract data requirements. Items of deliverable data required by this specification are cited in the following paragraph herein:

Paragraph	Data Requirement	Applicable DID*
4.5	Quality conformance inspection data	-

DIDS (Data Item Descriptions/DD Forms 1664) for the above requirements will be documented in the applicable ADL (Authorized Data List). Such data will be delivered as identified on completed (numbered) DIDS when specified on DD Forms 1423 (Contract Data Requirements Lists) and incorporated into applicable contracts.

6.3 Supersession information. Molding material formerly covered by MIS 13498 is Class 1 material of MIL-P-81255A. Molding material formerly covered by MIL-I-81255 is Class 2 material of MIL-P-81255A.

6.4 Preproduction sample waiver. Preproduction samples submitted and approved on a recent contract may be accepted by the procuring activity in lieu of an additional preproduction inspection. When the preproduction sample is waived (see 6.2.1(c)) the procurement document

should contain a statement specifying that the standards of workmanship exhibited by the previously approved preproduction sample shall determine the minimum requirements of the current contract or order.

6.5 Due to the comprehensive nature of this revision the margins of this specification have not been marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue have been made. Bidders and contractors are advised to evaluate the requirements of this document based on the entire content irrespective of the relationship to the last previous issue.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

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DOCUMENT IDENTIFIER AND TITLE

MIL-P-81255A, Plastic Molding Material, Asbestos Phenolic

NAME OF ORGANIZATION AND ADDRESS

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?
   A. GIVE PARAGRAPH NUMBER AND WORDING.

   B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY DOCUMENT REQUIREMENT CONSIDERED TOO RIGID

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