MIL-S-19653B(SH)
27 July 1984
SUPERSEDING
MIL-S-19653A(SHIPS)
5 July 1957
(See 6.5)

MILITARY SPECIFICATION

SEALING COMPOUND (WOOD BEDDING), FORTIFIED

This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers a permanently plastic, waterproofing sealing compound for use between inner and outer planking of double planked hulls, and on other faying surfaces of wooden craft to prevent the passage or accumulation of water and to resist deterioration by decay fungi.

1.2 Classification. The compound shall be of the following types, as specified (see 6.2.1):

Type I - For use without fabric.
Type II - For use with fabric.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified, the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

CCC-C-419 - Cloth, Duck, Cotton, Unbleached, Plied-Yarns Army and Numbered.
CCC-C-432 - Cloth, Sheeting, Cotton, (Unbleached, Bleached, and Dyed).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FEDERAL (Continued)

PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing and Marking of.

STANDARDS

FEDERAL

FED-STD-313 - Material Safety Data Sheets Preparation and the Submission of.

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting 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. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

ASTM

D 297 - Rubber Products-Chemical Analysis. (DoD adopted)

D 1272 - Pentachlorophenol. (DoD adopted)

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2.1), a sample shall be subjected to first article inspection (see 4.4 and 6.3).

3.2 Materials. Except for the use of asbestos fiber or asbestos fiber containing components, wide latitude will be permitted in the selection of raw materials, provided the finished product conforms to the requirements of this specification. The compound shall be of uniform consistency, entirely usable for the purpose intended, and shall remain usable after the exposure test specified in 4.7.3. The compound shall contain no asbestos.

3.3 Application. Type I and II compounds shall be usable without thinning.

3.4 Preservative content. Type I and II compounds shall contain not less than 5 percent by weight of pentachlorophenol in accordance with ASTM D 1272. This corresponds to not less than 3.17 percent chlorine content (see 4.7.1).

3.5 Exposure to heat, cold and salt water. Type I and II compounds, when tested as specified in 4.7.3, shall shear with sliding and not in a manner indicative of brittleness. The compound shall exhibit no severe change in consistency after any of the exposures.

3.6 Type I, for use without fabric.

3.6.1 Application properties. When tested as specified in 4.7.2.1, the compound shall not run or sag in 24 hours and shall exhibit no property making application with a trowel to a vertical surface difficult.

3.6.2 Water permeability. The water permeability of the compound, when tested as specified in 4.7.4.2 shall not exceed 5 milligrams per square centimeter (mg/cm^2) for each 24 hours.

3.7 Type II, for use with fabric.

3.7.1 Application properties. When tested as specified in 4.7.2.2, the compound shall exhibit no property making brush application to wood or canvas difficult.

3.7.2 Water permeability. The water permeability of the compound, when tested as specified in 4.7.4.3 shall not exceed 1 mg/cm^2 for each 24 hours.

3.8 Material safety data sheet. The contracting activity shall be provided a material safety data sheet (MSDS) at the time of contract award. The MSDS is DD Form OSHA 20 and is found in FED-STD-313. The MSDS shall be included with each shipment of the material covered by this specification.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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 Classification of inspections. The inspection requirements specified herein are classified as follows:

(a) First article inspection (see 4.4).
(b) Quality conformance inspection (see 4.5).

4.3 Sampling.

4.3.1 Lot. For purposes of sampling, a lot shall consist of all compounds of the same type manufactured as one batch and offered for delivery at one time.

4.3.2 Sampling for first article inspection, comparison and lot acceptance tests. From each inspection lot, two containers shall be selected at random. From each of the two containers, 1-quart specimens shall be taken and placed in separate, clean, dry, metal or glass containers, sealed, marked and forwarded to the testing laboratory approved by the acquisition activity concerned.

4.3.2.1 When approved by the acquisition activity, sample specimens shall be selected in accordance with 4.3.2 with the following exception: Three quart samples may be taken instead of 1-quart samples. Each 3-quart sample shall be divided into three equal parts; one part to be delivered to the contractor, one part to the testing laboratory, and one part to be held by the Government inspector for use in case of dispute.

4.3.3 Sampling for examination of filled containers. A random sample of filled containers shall be selected in accordance with MIL-STD-105 at inspection level I to verify compliance with this specification regarding fill, closure, marking and other requirements not involving tests.

4.4 First article inspection. First article inspection shall consist of the examination specified in 4.6 and the tests as specified in 4.7. The contractor shall prepare a first article inspection report in accordance with the data ordering documents included in the contract or order (see 6.2.2).

4.5 Quality conformance inspection. Quality conformance inspection shall consist of comparison tests, lot acceptance tests and examination of filled containers as specified in 4.5.1 through 4.6.

4.5.1 Comparison tests. The contracting activity may require that subsequent lots of material be subjected to any or all of the first article inspections. If any sample of a lot should fail a comparison test, no further lot will be accepted until the contractor has presented sufficient evidence to show that the condition causing the failure has been corrected. A test report showing the results of the first article tests and the most recent comparison tests shall be made available to the contracting activity.

4.5.2 Lot acceptance tests. Lot acceptance tests shall consist of the tests of 4.7.1 and 4.7.2. Lots shall be accepted or rejected on the basis of the laboratory tests on the transmitted samples.

4.6 Examination of filled containers. Each sample container shall be examined for defects of construction of the container and the closure, for evidence of leakage, and for unsatisfactory markings; each filled container shall be weighed or examined to determine amount of contents. Any container in the sample having one or more defects, or under required fill shall be rejected, and if the number of defective containers exceeds the acceptance number of AQL 2.5 percent as specified in MIL-STD-105, the lot shall be rejected. Rejected lots may be resubmitted for examination provided the contractor has removed or reworked all nonconforming products.

4.7 Tests.

4.7.1 Preservative content. Pentachlorophenol shall be determined on the basis of organically-bound chlorine content as specified herein.

4.7.1.1 Organically-bound chlorine content. After thoroughly mixing the sample, accurately weigh a 5-gram portion into a pour-out centrifuge tube (Corning number 8260 lipped tube or equal). Add 20 milliliters (mL) C.P. benzene and stir thoroughly with a glass rod. Centrifuge at 1500 to 2000 revolutions per minute (r/min) for 5 minutes. Decant benzene extract into a 200 mL volumetric flask. Add another 20 mL benzene to the tube and again stir thoroughly. Centrifuge and decant as before. Repeat the benzene extraction four additional times, taking care to mix thoroughly each time. Add benzene to the volumetric flask to the mark and mix thoroughly. Pipette 50 mL of the resulting solution into a 300 mL standard taper-neck flask (if the condenser and flask of the type specified in ASTM D 297 are available, they may be used instead of the specified flask and condenser), add 15 mL of isopropyl alcohol (99 percent) and approximately 3 grams sodium. Connect flask to a water-cooled reflux condenser having a ground glass joint (complementary to the ground joint of the flask) and reflux for 2 hours. Destroy excess sodium by adding 15 mL of isopropyl alcohol followed by the careful addition of a 1:1 water-isopropyl alcohol solution. Add 50 mL of water and boil off benzene. Cool, neutralize with nitric acid (1:1) and add 5 mL excess. Add an accurately measured volume of 0.1N silver nitrate (approximately 25 mL) and coagulate the precipitate by heating on a steam bath for 30 to 45 minutes. Cool, add 20 mL of nitrobenzene and swirl for not less than 1 minute. Add 5 mL of ferric alum indicator (dissolve 125 grams of ferric aluminum sulphate in 300 mL of water, add 25 mL of freshly boiled nitric acid (cool before addition) and dilute with water to 500 mL) and titrate with 0.1N ammonium thiocyanate to a faint reddish-brown end point. Calculate net number of mL of silver nitrate used by sample. Calculate percentage of chlorine by the equation:

$$a = \frac{b \times 1.419}{\text{weight of sample}}$$

where:

a = percentage chlorine.
b = net number of mL of exactly 0.1000N silver nitrate used.

4.7.2 Application properties. Types I and II compounds shall be tested as specified in 4.7.2.1 and 4.7.2.2. The compound may also be tested in actual double planking construction.

4.7.2.1 Type I. A wooden frame 1/8 inch in thickness with a clear opening 3-inches square shall be clamped to a freshly sanded surface of Douglas fir plywood and placed in a vertical position. The 1/8-inch recess between the frame and the plywood surface shall be filled with the compound applied with a trowel. The wooden frame shall be removed and the plywood panel allowed to remain in a vertical position. Any running or sagging of the compound from its original position over a period of 24 hours shall be noted. With all materials at 70 ± 5 degrees Fahrenheit (°F), two samples shall be prepared. One sample shall be tested at room temperature of 70 ± 5°F and the other in an oven at 120 ± 2°F. Any difficulty in application shall be noted.

4.7.2.2 Type II. The compound shall be applied with a brush to a freshly sanded surface of Douglas fir, 8 inches square. An 8-inch square piece of type I, number 10 cotton duck in accordance with CCC-C-419 shall be placed over the coated Douglas fir and smoothed into place with gentle pressure. The cotton duck shall be given a brush coat of compound. Any difficulty in the application of a smooth brush coating on either the cotton duck or wood shall be noted. The compound and room temperature during this test shall be 70 ± 5°F.

4.7.3 Exposure-type I and type II compounds.

4.7.3.1 A layer of type I compound approximately 1/8-inch thick (type I, number 10 cotton duck and the procedure specified in 4.7.2.2 shall be used with type II compound) shall be included between two 1/2 by 3 by 5-inch Douglas fir plywood panels placed together to form a 3 by 4-inch overlapping section. The assembly shall be allowed to remain undisturbed for 48 hours under room conditions and shall then be placed in a circulating oven at 120°F for 24 hours. The assembly then shall be placed in a cold box at 0°F for 16 hours. Thereafter, the assembly shall be subjected to shearing in a tensile machine operated with a jaw separation of 1 linear inch per minute. Any brittleness or change in consistency of the compound shall be noted.

4.7.3.2 Salt water. A similar assembly, after 2 days' exposure to room conditions, shall be immersed in a 4-percent solution of sodium chloride for 30 days at room temperature. The assembly shall then be subjected to shear as specified in 4.7.3.1.

4.7.4 Water permeability.

4.7.4.1 Apparatus. The apparatus shall be made entirely of aluminum, and shall consist of a flanged, cylindrical cup, a flat ring 1/8-inch thick of the same dimensions as the cup flange, and three "C" clamps for clamping the ring to the cup. The cup shall be 1-1/2 inches in outside diameter (o.d.) and 5/8 inch in overall height, with a wall 1/16 inch and a bottom 1/8-inch thick. The flange shall be 1/8-inch thick and 13/32-inch wide.

4.7.4.2 Method for type I. A circular piece of cotton sheeting, in accordance with CCC-C-432, class I, type I or III, shall be placed in a flat surface and the aluminum ring placed on top. The 1/8-inch recess between the ring and the sheeting shall be filled, level with the upper ring surface, with compound. The ring with sheeting and compound shall be placed on the cup flange with the sheeting included between the flange and the ring. The assembly shall be allowed to remain under room conditions until successive weighings at 24-hour intervals shows a difference of less than 1 milligram (mg). The cup shall then be two-thirds filled with water, the ring with sheeting and cement clamped tightly in place, and the joint between the disk and the cup flange sealed with melted paraffin. The assembly shall be weighed to the nearest mg and inverted in a desiccator over concentrated sulfuric acid in a constant-temperature room at 70°F. After 24 hours the assembly shall be reweighed. From the loss in weight, the water permeability in mg/cm^2 of compound surface for each 24 hours shall be calculated.

4.7.4.3 Method for type II. A 4-inch square piece of type I, number 10 cotton duck in accordance with CCC-C-419 shall be brush-coated on both sides with compound and allowed to remain suspended under room conditions until successive daily weighings show a difference of not more than 1 mg. The coated cotton duck shall be cut into a circular sample 1-5/8 inches in diameter and assembled with the disk and water-filled cup, and the water permeability determined as specified in 4.7.4.2.

4.8 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

5. PACKAGING

(The preparation for delivery requirements specified herein apply only for direct Government acquisition.)

5.1 Packaging, packing and marking. The compound shall be furnished in 1- or 5-gallon cans or pails with fully removable lug covers respectively and packaged level A or C, packed level A, B or C as specified (see 6.2.1) and marked in accordance with PPP-P-1892.

5.2 Marking. Each container shall be marked or labeled describing the degree of safety hazard of the material and precautions to be observed for safe handling and use, consistent with OSHA requirements and the MSDS (see 6.2.1).

6. NOTES

6.1 Intended use. This specification is intended to cover a permanently plastic, waterproofing compound for use between inner and outer planking of double planked hulls and on the faying surfaces of wooden craft to prevent the passage or accumulation of water and to resist deterioration by decay fungi.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

(a) Title, number and date of specification.
(b) Type required (see 1.2).
(c) If first article inspection is required (see 3.1).
(d) Level of preservation, packaging and packing required (see 5.1).
(e) Degree of marking required (see 5.2).

6.2.2 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of FAR 52.227-7031 are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraph.

Paragraph no.	Data requirement title	Applicable DID no.	Option
4.4	First article inspection report	DI-T-4902	------

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5000.19L., Vol. II, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4 or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 First article inspection. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection as to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 The compound should be purchased by volume, the unit being a U.S. gallon at 60°F.

6.5 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Preparing activity:
Navy - SH
(Project 8030-N082)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-S-19653B(SH)	SEALING COMPOUND (WOOD BEDDING), FORTIFIED

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426

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