

INCH-POUND

MIL-P-24752(SH)
1 October 1990
SUPERSEDING
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MILITARY SPECIFICATION

PACKING MATERIAL, FLAX OR HEMP

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 flax or hemp packing material for use in hot or cold water, brine and fuel oil systems (see 6.1).

1.1.1 Specification coverage. This specification does not cover all types, classes and sizes of flax or hemp packing material, but only those most generally used by the Government.

1.2 Classification. Flax or hemp packing material shall be of the following classes, as specified (see 6.2).

Class 1 - Flax.

Class 2 - Hemp.

Class 3 - Flax and hemp.

1.2.1 Sizes. The packing material shall be furnished in the sizes specified (see 6.2).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 5330

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

- O-E-751 - Ether, Petroleum; Technical-Grade.
- SS-G-659 - Graphite; Dry (Lubricating).
- PPP-F-320 - Fiberboard: Corrugated and Solid, Sheet Stock (Container Grade) and Cut Shapes.

MILITARY

- MIL-L-19140 - Lumber and Plywood, Fire Retardant Treated.

STANDARDS

FEDERAL

- FED-STD-191 - Textile Test Methods.
- FED-STD-791 - Lubricants, Liquid Fuels, And Related Products; Methods of Testing.

MILITARY

- MIL-STD-2073-1 - DoD Materiel Procedures for Development and Application of Packaging Requirements.

(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issue of the document which is DoD adopted is that listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 3951 - Standard Practice for Commercial Packaging.
(DOD adopted)

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

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Material. The packing materials shall be composed of cleaned flax or hemp (*cannabis sativa*) fibers and a pure lubricant free from rancidity.

3.2 Lubricant. The packing material shall be thoroughly and evenly impregnated with the lubricant. The finished packing material shall contain not less than 35 nor more than 45 percent, by weight, of lubricant (see 4.4.2).

3.2.1 Oleic acid. The lubricant shall contain not more than the equivalent of 5.5 percent oleic acid (see 4.4.3).

3.2.2 Saponification number. The saponification number of the lubricant shall be not less than 185 nor more than 198 (see 4.4.4).

3.3 Fiber class. The class of fiber shall be as specified in 3.3.1 through 3.3.1.2.

3.3.1 Class 1, flax. Class 1 packing material shall be made from flax fibers.

3.3.1.1 Class 2, hemp. Class 2 packing material shall be made from hemp fibers.

3.3.1.2 Class 3, flax and hemp. Class 3 packing material shall be made from a mixture of flax and hemp fibers.

3.3.2 Fiber strength. The strength of the fiber shall be not less than 100 kilograms per gram per centimeter of length (see 4.4.5).

3.4 Construction. Packing material shall be either braided and squared, or rounded.

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3.5 Size and weight. The packing shall be furnished in the sizes shown in table I, as specified (see 6.2). The weight per linear yard of square packing, after the lubricant has been extracted shall be not less than that shown in table I. The weight of round packing is found by multiplying the weight of the corresponding size of square packing by 0.8.

TABLE I. Size and weight of packing.

Size of packing Inches	Weight per linear yard, minimum Pounds
1/8	0.012
3/16	.030
1/4	.054
5/16	.082
3/8	.12
7/16	.16
1/2	.21
9/16	.27
5/8	.33
11/16	.40
3/4	.48
13/16	.57
7/8	.66
15/16	.75
1	.84
1- 1/8	1.08
1- 1/4	1.35
1- 1/2	1.80
1- 3/4	2.25
2	2.65

3.6 Packing coated with graphite. When packing coated with graphite is required (see 6.2), it shall be in accordance with SS-G-659. Graphite packing shall not be used in seawater or brine solutions.

3.7 Workmanship. Packing material shall meet the requirements of this specification. Emphasis shall be on the quality of the packing material.

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 (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use

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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 ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractors overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Sampling.

4.2.1 Inspection lot. An inspection lot shall consist of all finished packing material of one class and size, produced under the same conditions, and offered for delivery at one time.

4.2.2 Sampling for visual and dimensional inspection. A random sample of coils or spools shall be selected from each inspection lot offered for inspection of visual and dimensional characteristics in accordance with table II.

TABLE II. Sampling for visual and dimensional inspection.

Number of coils or spools in lot	Number of coils or spools in sample
65 and under	7
66 to 180	25
181 to 300	35
301 to 500	50
501 to 800	75
801 to 1300	110
1301 and over	150

4.2.3 Sampling for lot acceptance tests. Four representative coils or spools of packing materials shall be selected at random from each inspection lot. Each sample coil or spool shall be selected from a different box. From each sample coil or spool, a 24-inch specimen shall be cut off for the tests specified in 4.4. For 1/8 and 3/16 inch sizes, a sample 24 inches long of the

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untreated flax or hemp shall be selected from the lot used in the manufacture of the packing material for the test specified in 4.4.1.

4.3 Inspection and tests.

4.3.1 Visual and dimensional inspection. Each of the sample coils or spools selected in accordance with 4.2.2 shall be visually and dimensionally inspected to verify compliance with this specification (see 6.3). Any coils or spool in the sample containing one or more visual or dimensional defects shall be rejected and the lot which it represents shall be rejected.

4.3.2 Lot acceptance tests. Each sample specimen selected in accordance with 4.2.3 shall be subjected to the tests specified in 4.4. If any specimen tested is found to be not in conformance with this specification, the lot which it represents shall be rejected.

4.4 Tests.

4.4.1 Weight. Each specimen shall be carefully weighed and measured. From the weight and measurement obtained here and the lubricant content of the packing material obtained in 4.4.2, the average weight per linear yard of the packing material after the lubricant has been extracted shall be calculated.

4.4.2 Lubricant. A specimen weighing 25 ± 2 grams shall be carefully unbraided into rovings, placed in a soxhlet extractor, and extracted with petroleum ether for 3 hours ± 5 min. The soxhlet shall fill and empty not less than three times an hour. The petroleum ether shall be evaporated from the extract, and the extract shall be dried for 1 hour ± 5 min at a temperature of 100 to 105 degrees Celcius ($^{\circ}\text{C}$), cooled and weighed. The amount of lubricant shall be calculated as follows:

$$\text{Lubricant, percent} = \frac{\text{weight of extract}}{\text{weight of specimen of packing}} \times 100$$

The petroleum ether used for extraction shall conform to O-E-751.

4.4.3 Oleic acid. Accurately weigh 10 ± 1 gram of the lubricant from 4.4.2 into a flask, add 50 ± 1 milliliter of 95 percent alcohol which has been neutralized with weak caustic soda, and heat to the boiling point. Agitate the flask thoroughly in order to dissolve the free fatty acids as completely as possible. Titrate while hot with aqueous tenth-normal alkali, free from carbonate, using phenolphthalein, alkali blue, or turmeric as an

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indicator. Agitate thoroughly after each addition of alkali. To express results as percentage of oleic acid, use the following equation:

1 milliliter of tenth-normal alkali = 0.0282 gram of oleic acid.

NOTE: In the above equation, alkali, 1 milliliter of which is equivalent to 0.5 percent of oleic acid, may be used.

4.4.4 Saponification number. The saponification number of the lubricant shall be determined as specified in method 5401 of FED-STD-791.

4.4.5 Fiber strength. A specimen of the packing shall be carefully unbraided into rovings. The lubricant shall be thoroughly washed from the specimen with gasoline and the packing allowed to dry by evaporation. A length of 9 ± 1 centimeter shall be cut from each of three rovings and each of these lengths shall be tested as follows: Weigh accurately on a chemical balance. Carefully untwist and straighten out the fibers, making them as nearly parallel as possible. Cement each end of the specimen with collodion for not more than 1/2 inch, care being taken not to twist the fibers during the cementing process. A fabric testing machine (FED-STD-191) operating at a speed of 12 ± 2 inches per minute, shall be used to determine the breaking strength. One-half inch of each end of the specimen shall be gripped in the clamps of the machine. The tensile strength of the fiber shall be calculated to kilograms per gram per centimeter of length. The formula used for the calculation shall be as follows, the average strength of the three specimens shall be reported as the tensile strength:

$$K = \frac{P \times L}{G}$$

Where:

K = tensile strength in kilograms per gram per centimeter of length.

P = breaking strength of specimen in kilograms.

L = length of specimen in centimeters.

G = weight of specimen in grams.

On the 1/8-inch and 3/16-inch sizes, this test shall not be made on the finished packing but on samples of the flax or hemp from the lot used in its manufacture.

4.5 Inspection of packaging. Sample packs and the inspection of the preservation, packaging, and marking for shipment, stowage, and storage shall be in accordance with the requirements of section 5 and the documents specified herein.

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5. PACKAGING

5.1 General.5.1.1 Navy fire-retardant requirements.

- (1) Treated lumber and plywood. Unless otherwise specified (see 6.2), all lumber and plywood including laminated veneer material used in shipping container and pallet construction, members, blocking, bracing, and reinforcing shall be fire-retardant treated material conforming to MIL-L-19140 as follows:

Levels A and B - Type II - weather resistant
Category I - general use

Level C - Type I - nonweather resistant
Category I - general use

- (2) Fiberboard. Fiberboard used in the construction of interior (unit and intermediate) and exterior boxes including interior packaging forms shall conform to the class-domestic/fire retardant or class-weather resistant/fire retardant materials requirements as specified (see 6.2) of PPP-F-320.

5.2 Preservation. Preservation shall be level A, C, or commercial as specified (see 6.2).

5.2.1 Level A. Packing shall be put-up on spool or in coils as specified herein.

5.2.1.1 Spools. Packing in diameter of 5/16 inch or less, shall be uniformly coiled and secured on spools as follows:

<u>Size of packing</u>	<u>Length of spool</u>
<u>Inch</u>	<u>Linear yards</u>
1/8	200
3/16	150
1/4	134
5/16	120

5.2.1.2 Coils. Packing in diameters of 3/8 inch or greater shall be uniformly coiled and secured in individual lengths as follows:

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Size of packing	Length of each coil	Number of coils a box
Inches	Linear yards	
3/8	9	8
7/16	8	8
1/2	7	6
9/16	6	6
5/8	5	5
11/16	5	5
3/4	5	4
13/16	5	4
7/8	4-1/2	3
15/16	4-1/2	3
1	4-1/2	3
1- 1/8	4	3
1- 1/4	4	2
1- 1/2	4	2
1- 3/4	4	1
2	4	1

5.2.1.3 Unit pack. Each spool or set of coils shall be wrapped in an opaque or transparent waterproof, greaseproof, flexible barrier material and sealed. Each wrapped set of coils or each spool shall be placed in a water resistant folding, setup, or metal edged paperboard or a class-weather resistant/fire retardant fiberboard (see 5.1.1(2)) box meeting the unit and intermediate container requirements of MIL-STD-2073-1. The container selection shall be at the option of the contractor.

5.2.2 Level C. Packing shall be preserved as specified under level A except that the interior boxes shall be as follows:

- (a) The paperboard containers shall be of the domestic or nonweather resistant type, class, or variety as applicable and,
- (b) The fiberboard containers shall be of the class-domestic/fire retardant material (see 5.1.1(2)). The box closure shall be in accordance with method I using pressure sensitive adhesive tape.

5.2.3 Commercial. Commercial packaging (cleaning, preservation, and unit package) shall be in accordance with ASTM D 3951.

5.3 Packing. Packing shall be level A, B, C or commercial as specified (see 6.2).

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5.3.1 General requirements for levels A, B and C. Containers selected (see 5.3.2), shall be of minimum weight and cube consistent with the protection required, or uniform size, and contain identical quantities of identical material.

5.3.2 Levels A, B and C containers. Packing preserved as specified (see 5.2), shall be packed in exterior shipping containers for the level of packing specified (see 5.3), in accordance with MIL-STD-2073-1, and herein. Unless otherwise specified (see 6.2), container selection shall be at the contractors option.

5.3.2.1 Caseliners, closure and gross weight.

5.3.2.1.1 Caseliners. Unless otherwise specified (see 6.2), level A shipping containers containing packing preserved level C or commercial shall be provided with waterproof caseliners in accordance with MIL-STD-2073-1.

5.3.2.1.2 Closure. Container closure, reinforcing, or banding shall be in accordance with the applicable container specification or appendix thereto except that weather-resistant fiberboard boxes shall be closed in accordance with method V and reinforced with nonmetallic or tape banding and domestic or domestic/fire retardant fiberboard boxes shall be closed in accordance with method I using pressure sensitive tape.

5.3.2.1.3 Weight. Wood, plywood, and cleated type containers exceeding 200 pounds gross weight shall be modified by the addition of skids in accordance with MIL-STD-2073-1 and the applicable container specification or appendix thereto.

5.3.3 Commercial. Packing, preserved as specified (see 5.2) shall be packed for shipment in accordance with ASTM D 3951 and herein.

5.3.3.1 Container modification. Shipping containers exceeding 200 pounds gross weight shall have a minimum of two, 3-inch by 4-inch nominal wood skids laid flat, or a skid or sill type base which will support the material and facilitate handling by mechanical handling equipment during shipment, stowage and storage.

5.4 Marking, levels A, B, C and commercial. In addition to any special marking required (see 6.2), interior packs and shipping containers shall be marked, including bar coding, for shipment, stowage, and storage in accordance with MIL-STD-2073-1.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

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6.1 Intended use. Packing material covered by this specification is for use on rods and valve stems under the following conditions:

- (a) Hot or cold water, or brine up to 300 pounds pressure.
- (b) Fuel oil up to 500 pounds pressure.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- (a) Title, number, and date of this specification.
- (b) Class required (see 1.2).
- (c) Issue of DoDISS to be cited in the solicitation and if required, the specific issue of individual documents referenced (see 2.1.1).
- (d) Size required (see 1.2.1 and 3.5).
- (e) If coated packing is required (see 3.6).
- (f) When fire retardant lumber and plywood is not required (see 5.1.1 (1)).
- (g) Class of fire retardant fiberboard required (see 5.1.1(2)).
- (h) Level of preservation and level of packing required (see 5.2 and 5.3).
- (i) Container selection if other than contractors option (see 5.2.1.3 and 5.3.2).
- (j) When caseliners are not required (see 5.3.2.1.1).
- (k) Special marking required (see 5.4).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DIDs) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DIDs are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DoD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

<u>Reference paragraph</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested Tailoring</u>
4.3.1	DI-E-2121	Certificate of Compliance	----

The above DIDs were those cleared as of the date of this specification. The current issue of DoD 5010.12-L, Acquisition

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Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DIDs are cited on the DD Form 1423.

6.4 Patent notice. When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government acquisition operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

6.5 Subject term (key word) listing.

Brine
Cannabis sativa fibers
Fuel oil systems
Hot or cold water
Rods
Valve stems

6.6 Subcontracted material and parts. The packaging or preparation for delivery requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

Preparing activity:
Navy - SH
(Project 5330-N126)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

- 1 The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given
- 2 The submitter of this form must complete blocks 4, 5, 6, and 7
- 3 The preparing activity must provide a reply within 30 days from receipt of the form

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-P-24752(SH)	2. DOCUMENT DATE (YYMMDD) 90/10/01
4. DOCUMENT TITLE PACKING MATERIAL, FLAX OR HEMP		
3. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed)		
5. REASON FOR RECOMMENDATION		
B. SUBMITTER		
a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (if applicable)	7. DATE SUBMITTED (YYMMDD)
B. PREPARING ACTIVITY		
a. NAME Technical Point of Contact (TPOC): Mr. Bill Sances (SEA 56X43) PLEASE ADDRESS ALL CORRESPONDENCE AS FOLLOWS:	b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON TPOC: 703-602-9422	
c. ADDRESS (Include Zip Code) Commander, Naval Sea Systems Command Department of the Navy (SEA 55Z3) Washington, DC 20362-5101	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041 3466 Telephone (703) 756-2340 AUTOVON 289-2340	