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MIL-P-2863B(SHIPS)
24 April 1963
SUPERSEDING
MIL-P-002863A(SHIPS)
5 February 1962
MIL-P-2863
4 September 1951

MILITARY SPECIFICATION

PACKING, PREFORMED, CONDENSER-TUBE (SYMBOL 1435)

1 SCOPE

1 1 This specification covers preformed packing (Symbol 1435) for sealing steam condenser tube leaders and steam type air ejectors

1 2 Classification. - Packing shall be of the following grades as specified (see 6 2)

Grade A - Lead-foil and fiber rings
Grade B - Copper-foil and fabric rings

2 APPLICABLE DOCUMENTS

2 1 Specifications, standards, drawings and publications - Not applicable

(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 document forms 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

OFFICIAL CLASSIFICATION COMMITTEE
Uniform Freight Classification Rules

(Application for copies should be addressed to the Official Classification Committee 1 Park Avenue at 33rd Street, New York 16, N Y)

3 REQUIREMENTS

3 1 Qualification. - Packing material furnished under this specification shall be a product which has been tested and passed the qualification tests specified herein, and has been listed on or approved for listing on the applicable qualified product list

3 2 Materials and construction -

3 2 1 The metal rings shall be built-up of metal foil or metal foil in combination with asbestos yarn or tape and die-formed to the dimensions required by the tube sizes. The fiber rings shall be made from vulcanized fiber tubing composed of cellulose

3.2.2 Resilience of metal rings. -

3 2 2 1 Grade A. - The resiliency shall be such that the change in height (compression) of a stack of six rings shall be not less than 0 10 inch or more than 0 20 inch when tested as specified in 4 5.1

3 2 2 2 Grade B - The resiliency shall be such that the change in height (compression) of a stack of six rings shall be not less than 0 02 inch or more than 0 05 inch when tested as specified in 4 5 1

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3 2 3 Sizes and weights -

3.2.3 1 Grade A. -

3 2 3 1 1 Metal rings - Metal rings shall be made of a lead-base metal foil, and shall conform to the sizes and weights shown in table I, as specified (see 6 2)

Table I - Sizes and weights of metal rings for grade A packing.

Size			Weight per 1,000 rings (minimum)
Inside diameter	Outside diameter	Length	
Inch	Inches	Inch	Pounds
5/8	25/32	5/16	14.00
3/4	29/32	5/16	17.50
7/8	1-1/32	5/16	19.00
1	1-5/32	5/16	21.00

3 2 3 1 2 Fiber rings - The fiber rings shall be cut from vulcanized fiber tubing, the fiber containing not more tha 0 50 percent of zinc chloride or mineral matter. The tubing shall be free from cracks, seams blisters, and tears, and shall be seasoned so that it can be readily be machined without causing component layers to crack or separate. The rings shall be free from burrs, and the ends shall be finished smooth. The rings shall be 3/16-inch long and the same outside and inside diameter as shown in table I

3 2.3.2 Grade B -

3.2 3.2.1 Metal rings. - The metal rings shall be made of copper-base metal foil, and shall conform to the sizes and weights shown in table II, as specified (see 6.2).

Table II - Sizes and weights of metal rings for grade B packing.

Size			Weight per 1,000 rings	
Inside diameter	Outside diameter	Length	Minimum	Maximum
Inch	Inch	Inch	Pounds	Pounds
5/8	25/32	3/16	2.74	4.24
5/8	25/32	1/4	3.80	5.30
5/8	25/32	3/8	4 50	6.00
5/8	25/32	13/32	4 75	6.25
5/8	25/32	7/16	5.25	6.75
3/4	29/32	1/4	4.60	6.10
3/4	29/32	3/8	5.00	6.50

3.2.3.2 2 Fabric expansion rings. - The fabric expansion ring shall consist of 80 percent asbestos tape, impregnated with teflon suspensoid and die formed to the sizes required. The ring shall be sufficiently resilient to insure flowing into the threads of the stuffing box by light caulking without deformation to the tube ends Sizes and weights shall conform to those shown in table III, as specified (see 6.2).

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Table III. - Sizes and weights of expansion rings.

Size			Weight per 1,000 rings	
Inside diameter	Outside diameter	Length	Minimum	Maximum
Inch	Inch	Inch	Pounds	Pounds
5/8	25/32	3/16	1 88	2.65
5/8	25/32	1/4	2 25	2 25
3/4	29/32	3/16	2.58	3 38

3 2.4 Tolerances. - A tolerance of minus 0, and plus 0.007 inch will be permitted on inside diameter A tolerance of plus or minus 1/32 inch will be permitted on outside diameter and length

3.3 Simulated performance. - The metal packing rings shall be sufficiently compressible or malleable so that they may be freely caulked into the tube sheet drilling and seal the pressure without impeding the movement of the tube or cause deformation of the tube. The packing shall remain tight and there shall be no leakage at the end of the test conditions specified in 4.5 3.2.

3.5 Workmanship. - The workmanship shall be first class in every respect

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 specifications where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4 2 Qualification tests. 1/ Qualification tests shall be conducted at a laboratory satisfactory to the Bureau of Ships. These tests shall consist of the tests specified in 4.5

4 3 Sampling. -

4 3.1 Inspection lot. - For purposes of sampling, a lot shall consist of all rings of one grade and produced under essentially the same conditions and offered for delivery at one time

4.3.2 Sampling for examination. - A random sample of rings shall be selected from each inspection lot of rings offered for examination for visual, dimensional, and weight characteristics (see 4.4) in accordance with MIL-STD-205, Inspection Level II. The Acceptable Quality Level shall be 2 5 percent defective.

4.3.3 Sampling for test of resilience - From each lot of metal rings, sample rings shall be selected in accordance with MIL-STD-105, Inspection Level L6 for the tests specified in 4 5 1. The Acceptable Quality Level shall be 4.0 percent defective.

4.3 4 Sampling of fiber rings for chemical composition - Two specimens, each consisting of six rings, shall be tested in accordance with 4.5.2.

4 4 Visual and dimensional examination. - The sample rings selected in accordance with 4.3.2 shall be examined, measured and weighed to verify conformance to the requirements of this specification which do not involve tests. Any nonconforming ring in each examination sample shall not be offered for delivery, and if the number of nonconforming rings in the sample exceeds the acceptance number for that sample, this shall be cause for rejection of the entire lot.

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4 5 Test procedures. -

4 5 1 Resilience of metal rings - Six packing rings shall be placed on a close-fitting metal rod mounted on a supporting base The height of the stack of six rings (designated H1) shall be measured A weight of 70 pounds shall be placed on the top of the stack for a period of 5 minutes and the height (designated H2) again measured. Resiliency shall be calculated as follows

H1 - H2 - Change in height (compression)

4 5 2 Chemical composition of fiber ring -

4 5 2 1 Zinc chloride determination. - A test specimen consisting of grams of finely dividied particles, such as millings or filings, of the vulcanized fiber shall be dried for 2 hours at 105° to 110° Centigrade (C.) The dried specimen shall then be placed in a soxhlet, Wiley-Richardson or similar type extractor, and extracted with distilled water for 3 hours The rate of extraction with the Wiley-Richardson type extractor shall be sufficient to cause the tube containing the sample to be filled by condensation and emptied by the siphon at least six times per hour When the Soxhlet or similar type extractor is used, the tube shall be filled and emptied at a rate of at least three cycles per hour. After this extract has cooled, 0.5 milliliter of potassium chromote solution (10 percent) shall be added and the extract titrated with standard silver nitrate solution The end point is indicated by the appearance of a permanent red color. A blank test shall be made on an equal volume of distilled water and potassium chromote solution and the result shall be subtracted from that of the specimen The net result shall be calculated in terms of zinc chloride.

4 5 3 Simulated performance - The test shall be conducted in an apparatus consisting of two 1-1/4 inch thick brass tube sheets bolted to the flanged ends of a 6-inch length of 8-inch pipe Each tube sheet shall contain 6 stuffing boxes drilled 3/4-inch deep and tapped for 5/8-inch and 3/4-inch condenser tubes. Copper-nickel alloy tubes of 0.049-inch wall thickness shall be used in the test

4 5 3.1 Procedure -

4 5 3 1 1 Grade A - The six tube ends shall be packed at both ends with two metallic and two fiber rings in the sequence of fiber and metal without the use of screw ferrules.

4 5 3 1 2 Grade B - The six tube ends shall be packed at both ends with two metal rings and one fabric expansion ring next to the screw ferrules Ferrules are 5/8-inch long with 18 threads per inch.

4 5.3 2 Conditions - The performance of the packing in maintaining watertight tube-sheet end stuffing boxes shall be determined under the following successive conditions

(a) Water at 10 pounds per square inch (psi) and 70° Fahrenheit (F) for 1/2 hour for initial tightness
(b) Water at 50 psi, 200°F for grade A, and 300 psi, 200°F for grade B packings maintained for 5 hours
(c) Condenser tubes moved ten times alternately forward and backward 1 8 inch while condition (b) is maintained Tube movement is accomplished by light blows of a one-pound hammer on a guide pin inserted in the end of the tube
(d) Condenser drained and vented for two weeks
(e) Twenty cycles of thermal and pressure shocks caused by sudden changes of the circulating water from 10 psi and 70°F to 50 psi and 200°F. Tube movement is not conducted between each cycle

4.6 Examination of preparation for delivery. - The packaging, packing, and marking of packing material shall be subject to examination to determine compliance with the requirements of Section 5 of this specification.

5 PREPARATION FOR DELIVERY

5 1 Domestic shipment and early installation. -

5.1 1 Packaging - Packaging shall be sufficient to afford adequate protection against physical damage during shipment from the supply source to the using activity and until early installation.

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5 1 2 Packing - Packing shall be accomplished in a manner which will insure acceptance by common carrier and will afford protection against physical or mechanical damage during direct shipment from the supply source to the using activity for early installation The shipping containers or method of packing shall conform to the Uniform Freight Classification Rules and Regulations or other carrier regulations as applicable to the mode of transportation

5 1 3 Marking. - Shipment marking information shall be provided on interior packages and exterior shipping containers in accordance with the contractor's commercial practice The information shall include nomenclature, Federal stock number or manufacturer's part number, grade, contract or order number, contractor's name and destination

5 2 Domestic shipment and storage or overseas shipment - The requirements and levels of packaging, packing and marking for shipment shall be specified by the procuring activity (see 6. 2).

(5. 2 1 The following provides various levels of protection during domestic shipment and storage or overseas shipment, which may be required when procurement is made (see 6 2)

5 2 1 1 Packaging. -

5 2 1 1 1 Level A -

5 2 1 1.1 1 Metal ring and fabric expansion ring. - Metal rings shall be placed on paperboard tubes in such a manner as to preserve their original shape and to prevent deformation. Tubes shall contain the same number of rings of like grade and size The tubes shall be wrapped individually with not less than 30-pound (24 x 36-500) basis weight kraft paper. The wrapped tubes shall be packaged in containers conforming to PPP-B-566, PPP-B-636, PPP-B-665 or PPP-B-676. Box closure shall be as specified in the applicable box specification or appendix thereto. The gross of paperboard folding and set-up boxes shall not exceed 10-pounds, metal stayed boxes shall not exceed 20-pounds, and fiberboard boxes 40 pounds

5 2.1 1 1 2 Fiber rings - Fiber rings shall be packaged in bulk in containers described in 5 2.1 1 1 1.

5.2.1.2 Packing. -

5.2.1.2.1 Level A. - Rings shall be packed in boxes conforming to any one of the following specifications at the option of the supplier:

Specification	Type or class
PPP-B-585	Class 3, use
PPP-B-591	Overseas type
PPP-B-601	Overseas type
PPP-B-621	Class 2
PPP-B-636	Class 2
PPP-B-576	Class 2

Shipping containers shall have caseliners conforming to MIL-L-10547. Caseliners shall be closed and sealed in accordance with the appendix to MIL-L-10547. Caseliners for class 2 fiberboard boxes conforming to PPP-B-636 may be omitted provided all corners and edge seams and manufacturer's joints are sealed with 2-inch wide tape conforming to PPP-T-76. Boxes shall be closed, strapped or banded in accordance with the applicable box specification or appendix thereto. The gross weight of wood or wood-cleated boxes shall not exceed 200 pounds.

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5.2.1.2.2 Level B. - Rings shall be packed in boxes conforming to any one of the following specifications at the option of the supplier.

Specification	Type or Class
PPP-B-585	Class 1 or 2 use
PPP-B-591	Domestic type
PPP-B-601	Domestic type
PPP-B-621	Class 1
PPP-B-636	Class 2
PPP-B-576	Class 1

Box closures shall be as specified in the applicable box specification or appendix thereto. The gross weight of wood or wood-cleated boxes shall not exceed 200 pounds.

5.2 1 3 Marking - In addition to any special marking required, interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129)

6 NOTES

6.1 Intended use - Grade A rings are intended for use for packing steam condenser tube header stuffing boxes. Grade B rings are intended for use for packing steam type air ejector stuffing boxes.

6.2 Ordering data. - Procurement documents should specify the following·

(a) Title, number, and date of this specification.
(b) Grade required (see 1.2)
(c) Size required (see 3.2.3).
(d) Packaging, packing or marking requirements other than those required by paragraph 5 1 (see 5 2).

6.3 With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in Qualified Products List QPL-2863, whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the qualified products list is the Bureau of Ships, Department of the Navy, Washington 25, D. C., and information pertaining to qualification of products may be obtained from that activity. Application for Qualification tests shall be made in accordance with "Provisions Governing Qualification" (see 6.4).

6.4 Copies of "Provisions Governing Qualification" may be obtained upon application to Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia 20, Pennsylvania.

Notice. - When Government drawings, specifications or other data are used for any purpose other than in connection with a definitely related Government procurement 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.

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SPECIFICATION ANALYSIS SHEET
NAVSHIPS-0663 (8-61)

INSTRUCTIONS

BUDGET BU. NO. 45-R300

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 Bureau of Ships

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 dotted lines on reverse side staple in corner and send to Bureau of Ships Specifications and Standardization Branch, Washington 25 D C

SPECIFICATION

ORGANIZATION	CITY	STATE

CONTRACT NO	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT
		$

MATERIAL PROCURED UNDER A DIRECT GOVERNMENT CONTRACT ☐ OR A 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 THE ANSWER IS "YES" IN WHAT WAY?

4 REMARKS (Attach any pertinent data which may be of use in improving this specification) PLACE THIS FORM AND PAPERS IN AN ENVELOPE AND SEND TO THE BUREAU

SUBMITTED BY (Print name and activity)	DATE

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NOTICE
OF VALIDATION

MIL-P-2863B(SHIPS)
NOTICE 1
30 June 1986

MILITARY SPECIFICATION

PACKING, PREFORMED, CONDENSER-TUBE
(SYMBOL 1435)

MIL-P-2863B(SHIPS), dated 24 April 1963, and Amendment 1, dated 5 March 1965, have been reviewed and determined to be current.

Preparing activity:
Navy - SH

AMSC N/A
FSC 5330

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MILITARY SPECIFICATION

PACKING, PREFORMED, CONDENSER-TUBE (SYMBOL 1435)

This amendment forms a part of MIL-P-2863B(SHIPS), dated 24 April 1963, and is approved for use within the Department of the Navy and is available for use by all Departments and Agencies of the Department of Defense.

PAGE 1

1.2, line 3: Delete and substitute:

"Grade B - Copper rings and fabric ring."

* 3.1: Delete and substitute:

"3.1 Qualification for grade A only. Packing material for grade A furnished under this specification shall be a product which is authorized by the qualifying activity for listing on the applicable qualified products list at the time set for opening of bids (see 4.2.1 and 6.3)."

* Add parenthetical statement after 3.1.1:

"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 55Z3, 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

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* Add as new 3.1.1:

"3.1.1 First article inspection for grade B only. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.2.1 and 6.4)."

PAGE 2

3.2.3.2: Add: "Grade B packing shall consist of two copper rings and one asbestos fabric ring."

PAGE 3

* 4.2: Delete and substitute:

"4.2 Qualification inspection for grade A only. Qualification inspection for grade A packing material shall be conducted at a laboratory satisfactory to the Naval Sea Systems Command. Qualification inspection shall consist of the tests specified in 4.5."

* Add as new 4.2.1:

"4.2.1 First article inspection for grade B only. First article inspection for grade B packing material shall consist of the tests specified in 4.5."

4.3.3, line 2: Delete "L6" and substitute "S-3".

PAGE 6

* 6.3: Delete and substitute:

"6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in Qualified Products List QPL-2863 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification SD-6" (see 6.3.1)."

* Add as new 6.3.1:

"6.3.1 Copies of "Provisions Governing Qualification SD-6" may be obtained upon application to Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120."

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* 6.4: Delete and substitute:

"6.4 First article. When a first article inspection is required, the item should be a first article sample. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection 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."

LAST PAGE

* DD 1426, Standardization Document Improvement Proposal: Delete address and substitute:

"COMMANDER
NAVAL SEA SYSTEMS COMMAND (SEA 55Z3)
DEPARTMENT OF THE NAVY
WASHINGTON, DC 20362-5101"

The margins of this amendment are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment 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 amendment.

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