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DETAIL SPECIFICATION

GASKET AND PACKING MATERIAL, RUBBER, FOR USE WITH POLAR FLUIDS, STEAM, AND AIR AT MODERATELY HIGH TEMPERATURES

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 rubber gaskets, packing, seals, strips, molded forms, and sheet material for use in hot air, hot water, steam, and various polar fluids such as aqueous monoethanolamine (MEA), at moderately high temperatures (see 6.1).

1.2 Classification. The rubber gasket and packing material are of the following grades, as specified (see 6.2).

Grade 1 - Nominal 65 durometer hardness.
Grade 2 - Nominal 80 durometer hardness.
Grade 3 - Nominal 90 durometer hardness.

1.2.1 O-ring identification. Unless otherwise specified (see 6.2), o-rings are identified by a part identifying number (PIN) consisting of the specification designator (M22050); followed by a hyphen and the grade designator (1, 2, or 3); followed by another hyphen and the SAE AS 568 dash number for size designation. (Example: M22050-2-236).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to Commander, Naval Sea Systems Command, ATTN: SEA 05Q, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to commandstandards@navsea.navy.mil, with the subject line "Document Comment". Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at http://assist.daps.dla.mil.

AMSC N/A FSC 5330

2.2 Government documents.

2.2.1 Specifications, standards and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL STANDARDS

FED-STD-601 - Rubber: Sampling and Testing.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-M-23573 - Monoethanolamine Chelating Agent Solution.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-289 - Visual Inspection Guide for Rubber Sheet Material.
MIL-STD-407 - Visual Inspection Guide for Rubber Molded Items.
MIL-STD-413 - Visual Inspection Guide for Elastomeric O-Rings.

(Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch or http://assist.daps.dla.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF LABOR

Code of Federal Regulations (CFR)

40 CFR 261 - Identification and Listing of Hazardous Waste.

(Copies of these documents are available online at www.access.gpo.gov/nara/cfr or from the Superintendent of Documents, U.S. Government Printing Office, North Capitol & "H" Streets, N.W., Washington, DC 20402-0002.)

BUREAU OF MEDICINE AND SURGERY (BUMED)

BUMED INST 6270.8 - Procedures for Obtaining Health Hazard Assessments Pertaining to Operational Use of a Hazardous Material.

(Copies of this document are available online at https://bumed.med.navy.mil or from Bureau of Medicine and Surgery, Department of the Navy, 2300 E Street, NW, Washington, DC 20372-5300.)

NAVAL SEA SYSTEMS COMMAND (NAVSEA)

S9510-AB-ATM-010 Rev 2 of 30 July 1992 - Nuclear Powered Submarine Atmosphere Control Manual.

(Copies of this document are available from the Naval Sea Systems Command, Code SEA 05Z9, 1333 Isaac Hull Avenue, SE, Stop 5133, Washington Navy Yard DC 20376-5133.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

D 395 - Standard Test Methods for Rubber Property - Compression Set. (DoD adopted)
D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension. (DoD adopted)
D 471 - Standard Test Method for Rubber Property - Effect of Liquids. (DoD adopted)
D 512 - Standard Test Methods for Chloride Ion in Water. (DoD adopted)
D 573 - Standard Test Method for Rubber - Deterioration in an Air Oven. (DoD adopted)
D 2240 - Standard Test Method for Rubber Property - Durometer Hardness. (DoD adopted)
D 3767 - Standard Practice for Rubber - Measurement of Dimensions. (DoD adopted)

(Copies of these documents are available from www.astm.org or ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.)

SAE INTERNATIONAL

AS 568 - Aerospace Size Standard for O-Rings. (DoD adopted)

(Copies of these documents are available from www.sae.org or the SAE World Headquarters, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 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 material shall be made from an ethylene-propylene elastomeric compound that will meet the applicable requirements specified herein. Suggested formulations are given in 6.4 for both grade 1 and grade 2 material. The material shall contain no low melting point metals such as mercury, lead or antimony used in either the formulation or preservation and packaging materials.

3.2 Form. The material shall be furnished in the form of sheets, strips, gaskets, packings, seals, or molded items of the sizes specified (see 6.2).

3.2.1 O-rings. Unless otherwise specified (see 6.2), the required o-ring shall be identified by its PIN (see 1.2.1) and shall have the dimensions and tolerances in accordance with the requirements of the SAE AS 568 dash number in its PIN.

3.3 Physical requirements of the rubber. The rubber compound used in the gaskets and packing material shall conform to the applicable requirements in Table I when tested as specified herein.

TABLE I. Physical requirements of rubber compounds.

	Grade 1	Grade 2	Grade 3
Initial properties:			
Tensile strength, psi, minimum (min)	2400	2400	2200
Ultimate elongation, percent, min.	250	150	80
Hardness, Shore A durometer, points within 1 sec	65 ± 5	80 ± 5	90 ± 5
Leachable chlorides (parts per million) maximum (max)	200	200	200
Properties after oven aging 166 Hours at 280 degrees Fahrenheit (° F)			
Tensile strength, percent of initial, min.	70	70	70
Ultimate elongation, percent of initial, min.	70	70	50
Hardness, change in Shore A durometer, points max.	15	15	15
Compression set, percent, max.	60	60	35
Properties after immersion in distilled water for 166 hours at 330°F:			
Tensile strength, percent of initial, min.	80	80	80
Ultimate elongation, percent of initial, min.	80	80	80
Volume change, percent (no shrinkage allowed)	0 to 10	0 to 10	0 to 10
Properties after immersion in 25 percent aqueous solution of MEA for 166 hours at 330°F:			
Tensile strength , percent of initial, min.	80	80	--
Ultimate elongation, percent of initial, min.	80	80	--
Volume change, percent (no shrinkage allowed)	0 to 10	0 to 10	--
Properties after 166 hours in steam at 330°F:			
Tensile strength, percent of initial, min.	80	80	80
Ultimate elongation, percent of initial, min.	80	80	80
Volume change, percent, max.	5	5	5
Properties after 70 hours in steam at 390°F:			
Tensile strength, percent of initial, min.	--	--	90
Ultimate elongation, percent of initial, min.	--	--	85
Hardness, change in Shore A durometer, points max.	--	--	3
Volume change, percent (no shrinkage allowed)	--	--	0 to 8
Compression set, percent, max.	--	--	60
Properties after 166 hours in steam at 550°F:			
Tensile strength, percent of initial, min.	--	--	75
Ultimate elongation, percent of initial, min.	--	--	15
Hardness, change in Shore A durometer, points max.	--	--	10
Volume change, percent (no shrinkage allowed)	--	--	0 to 5
Compression set, percent, max.	--	--	90

3.4 Identification. Material acquired under this specification shall be identified with white markings. A permanent marking material that will have no deleterious effect on the rubber shall be used or in the case of individual one-item packaging, the marking may be put on the package.

3.5 Workmanship. The material shall be examined for defects as specified herein.

3.6 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.7 Toxicity. When evaluated in accordance with 4.5, the gasket and packing material shall have no adverse effect on the health of personnel when used for its intended purpose and shall not cause any environmental problems during waste disposal (see 4.5 and 6.6).

3.8 Disposal. The manufacturer shall certify that the gasket and packing material shall not contain any hazardous material or exhibit any hazardous characteristic as defined under 40 CFR 261 (Code of Federal Regulations). The manufacturer shall make every effort to adhere to this requirement. If no product which meets this requirement can be identified, (i.e., if the gasket and packing material does contain a hazardous material), the manufacturer shall provide information detailing proper disposal of the gasket and packing material.

3.9 Off-gassing. The gasket and packing material shall meet the requirements in the Nuclear Powered Submarine Atmosphere Control Manual, NAVSEA Technical Manual S9510-AB-ATM-010 Rev 2, for a usage category of Limited (see 4.6 and 6.7).

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Conformance inspection (see 4.2)

4.2 Conformance inspection. Conformance inspection shall consist of the examinations and tests specified in 4.3.

4.2.1 Lot. For the purpose of conformance inspection and testing, a lot is defined as all the material produced in one facility, using the same materials, of the same grade, using the same production processes, not exceeding 1000 pounds, and being offered for delivery at one time.

4.2.2 Sampling for conformance inspection. As a minimum, the contractor shall randomly select a sample quantity of test specimens as defined in 4.2.3 from each lot of completed material in accordance with Table II and inspect them in accordance with the examinations and test specified herein. If one or more defects are found in any sample, the entire lot shall be rejected. The contractor has the option of screening 100 percent of the rejected lot for the defective characteristic(s) or providing a new lot which shall be inspected in accordance with the sampling plan contained herein. The contractor shall maintain for a period of three years after contract completion records of inspections, tests, and any resulting rejections.

TABLE II. Sample size for conformance inspections and tests.

Lot size number of gaskets, molded items, packings, or unit areas of sheets or strips	Sample size number of gaskets, molded items, packings, or unit areas of sheet or strips
2 to 50	5
51 to 90	7
91 to 150	11
151 to 280	13
281 to 500	16
501 to 1200	19
1201 to 3200	23
3201 and over	29

4.2.3 Sampling for tests. Representative samples shall be taken at random from each lot that passes the examination of 4.3.1, in sufficient quantity to conduct the conformance tests specified in 4.3.2. If the items are of such size or shape that test specimens cannot be prepared form the, substitute sample shall be provided in the form or a piece or pieces of rubber having dimensions appropriate to the tests required. The substitute samples shall be certified by the contractor to be of identical material and equivalent cure to that used in the lot of finished material offered for delivery.

4.3 Examinations and tests.

4.3.1 Visual and dimensional examination. Each of the samples taken in accordance with 4.2.2 shall be subjected to surface examinations for identification, workmanship, dimensions, and tolerances. MIL-STD-289, MIL-STD-407, or MLD-STD-413, as applicable to the product type, shall be used to determine and evaluate visual defects. The dimensions shall be determined in accordance with the applicable method specified in ASTM D 3767.

4.3.2 Conformance tests. Conformance tests shall be conducted on samples selected in accordance with 4.2.4. Conformance tests shall consist of the examination and tests specified in 4.4 (see 6.3).

4.3.3 Action in case of nonconformance. If any of the samples in the conformance tests are found not to be in conformance with the requirements of the specification, the lot which they represent shall be rejected.

4.4 Test methods.

4.4.1 Testing conditions. Unless otherwise specified herein, the testing shall be conducted at a temperature of $80^{o} \pm 9^{o}$F.

4.4.2 Tensile properties. The tensile strength and ultimate elongation shall be determined by ASTM D 412. Die III specimens that are 0.080 and $\pm$ 0.010 inch thick shall be used for determinations of tensile properties.

4.4.3 Hardness. Hardness shall be determined with a Shore A durometer on specimens that are 0.500 $\pm$ 0.010 inch thick and at least 1.129 inch diameter, in accordance with ASTM D 2240. The hardness readings shall be taken within 1 second after firm contact is made between the rubber and the presser foot of the durometer.

4.4.4 Oven aging. ASTM D 573 shall be used for oven aging the test specimens as specified for the individual tests, with the following exception: The aging period shall be 166 $\pm$ 1 hours at $280^{o} \pm 2^{o}$F. After the aging period, the tensile hardness specimens shall be set aside for 16 to 96 hours at $80^{o} \pm 9^{o}$F before determining the required property.

4.4.4.1 Tensile properties after oven aging. The tensile properties after oven aging shall be determined by the procedure specified in 4.4.2.

4.4.4.2 Hardness after oven aging. The hardness after oven aging shall be determined by the procedure specified in 4.4.3.

4.4.4.3 Compression set after oven aging. Compression set shall be determined in accordance with ASTM D 395 except that three 0.500 $\pm$ 0.010 inch thick specimens shall be tested and the specimens shall be held at a 25 percent deflection during oven aging.

4.4.5 Immersion in hot distilled water. Test specimens for the individual tests shall be immersed in distilled water in a covered glass jar. The jar shall be put in a container capable of withstanding an internal pressure of 300 pounds per square inch (lb/in^2). The container shall be sealed and placed in a steam autoclave and heated for 166 $\pm$ 1 hours at $330^{o} \pm 2^{o}$F.

4.4.5.1 Tensile properties after immersion in hot distilled water. After immersion in hot distilled water as specified in 4.4.5, the tensile properties shall be determined in accordance with ASTM D 471 and as specified in 4.4.2. Tensile strength shall be based on the swollen cross-sectional area.

4.4.5.2 Volume change after immersion in hot distilled water. Volume change after immersion in hot distilled water shall be determined in accordance with Method 6211 of FED-STD-601.

4.4.6 Immersion in 25 percent aqueous solution of MEA. Test specimens for the individual tests shall be immersed in a 25 percent by volume aqueous solution of MEA in a covered glass jar. The jar shall be put in a container capable of withstanding an internal pressure of 300 lb/in^2. The container shall be sealed and placed in a steam autoclave and heated for 166 $\pm$ 1 hours at 330° $\pm$ 2°F. The MEA shall conform to MIL-M-23573. These tests are not applicable to Grade 3 material.

4.4.6.1 Tensile properties after immersion in MEA solution. After immersion as specified in 4.4.6, the tensile properties shall be determined as specified in 4.4.5.1.

4.4.6.2 Volume change after immersion in MEA solution. After immersion as specified in 4.4.6, the volume change shall be determined in accordance with Method 6211 of FED-STD-601.

4.4.7 Aging in steam.

4.4.7.1 Aging in steam at 330°F. Test specimens for the individual tests shall be exposed to steam in an autoclave for 166 $\pm$ 1 hours at 330°F $\pm$ 2°F. After the aging period, the tensile specimens shall be set aside at 80° $\pm$ 9°F for 16 to 96 hours before determining the required property.

4.4.7.1.1 Tensile properties after aging in steam at 330°F. After aging in steam as specified in 4.4.7.1, the tensile properties shall be determined as specified in 4.4.2.

4.4.7.1.2 Volume change after aging in steam at 330°F. After aging in steam as specified in 4.4.7.1, the volume change shall be determined in accordance with Method 6211 of FED-STD-601.

4.4.7.2 Aging in steam at 390°F. Test specimens for the individual tests shall be exposed to steam in an autoclave for 70 $\pm$ 1 hours at 390° $\pm$ 2°F. After the aging period, the tensile specimens shall be set aside at 80° $\pm$ 9°F for 16 to 96 hours before determining the required property.

4.4.7.2.1 Tensile properties after aging in steam at 390°F. After aging in steam as specified in 4.4.7.2, the tensile properties shall be determined as specified in 4.4.2.

4.4.7.2.2 Hardness after aging in steam at 390°F. After aging in steam as specified in 4.4.7.2, the hardness shall be determined as specified in 4.4.3.

4.4.7.2.3 Volume change after aging in steam at 390°F. After aging in steam as specified in 4.4.7.2, the volume change shall be determined in accordance with Method 6211 of FED-STD-601.

4.4.7.2.4 Compression set after aging in steam at 390°F. After aging in steam as specified in 4.4.7.2, the compression set shall be determined in accordance with ASTM D 395 except that three 0.500 $\pm$ 0.010 inch thick specimens shall be tested and the specimens shall be held at a 25 percent deflection during steam aging.

4.4.7.3 Aging in steam at 550°F. Test specimens for the individual tests shall be exposed to steam in an autoclave for 166 $\pm$ 1 hours at 550° $\pm$ 2°F. After the aging period, the tensile specimens shall be set aside at 80° $\pm$ 9°F for 16 to 96 hours before determining the required property.

4.4.7.3.1 Tensile properties after aging in steam at 550°F. After aging in steam as specified in 4.4.7.3, the tensile properties shall be determined as specified in 4.4.2.

4.4.7.3.2 Hardness after aging in steam at 550°F. After aging in steam as specified in 4.4.7.3, the hardness shall be determined as specified in 4.4.3.

4.4.7.3.3 Volume change after aging in steam at 550°F. After aging in steam as specified in 4.4.7.3, the volume change shall be determined in accordance with Method 6211 of FED-STD-601.

4.4.7.3.4 Compression set after aging in steam at 550°F. After aging in steam as specified in 4.4.7.3, the compression set shall be determined in accordance with ASTM D 395 except that three 0.500 ± 0.010 inch thick specimens shall be tested and the specimens shall be held at a 25 percent deflection during steam aging.

4.4.8 Water leachable chlorides. The following test method shall be used:

a. Two test specimens, each of approximately but not less than 14 grams shall be taken. Each test specimen shall be taken from a different sample. Test specimens for rubber bonded paper shall be taken from the samples of the first and the last roll of the lot. Test specimen of packing material shall be representative of the sample cross section.

b. The test specimens shall be unraveled and cut into pieces no larger than ¼ by ½ inch.

c. Each test specimen shall be weighted, transferred to an Erlenmeyer flask equipped with a reflux condenser, covered with 200 to 300 milliliters (ml) of distilled or demineralized water and simmered in the range of 220° to 212 °F for a minimum of 6 hours. The leach water shall then be separated by filtration and the filter rinsed. A blank determination shall be run using similarly cleaned equipment and distilled or demineralized water from the same source.

d. The extracted chloride ion shall be determined by the mercuric nitrate titration method, ASTM D 512, referee method A or equal, and shall be corrected by the results of the blank determination.

e. The results of each test shall be calculated as net parts per million of extractable chloride ion by weight of the test specimen.

4.5 Toxicity. The gasket and packing material shall be evaluated by the Navy Environmental Health Center (NAVENVIRHLTHCEN) using the administrative Health Hazard Assessment (HHA). A flowchart for this process can be found as enclosure (1) of BUMEDINST 6270.8. The HHA is a review of the gasket and packing material based on information submitted by the manufacturer, to assess health hazards associated with the handling, application, use and removal of the product. Sufficient data to permit a HHA of the product shall be provided by the manufacturer/distributor to the NAVENVIRHLTHCEN. To obtain current technical information requirements specified by the NAVENVIRHLTHCEN, see 6.6.

4.6 Off-gassing. The gasket and packing material shall be tested in accordance with the Nuclear Powered Submarine Atmosphere Control Manual, NAVSEA Technical Manual S9510-AB-ATM-010 Rev 2, by a Government approved testing facility. The results shall be submitted to the Government for evaluation and approval for use (see 3.9 and 6.7).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The material furnished under this specification is intended for use in air at temperatures up to 230°F, and for use in water, steam, and certain polar fluids at temperatures up to 280°F. This material is especially intended for use in CO_2 scrubbers, in high discharge systems, and in flexible joints. The suitability of this

material for use in fluids other than those designated in this specification is determined beforehand in appropriate immersion tests.

6.1.1 Grade 1 material is intended for use in all applications in 1.1 up to and including 230°F.

6.1.2 Grades 2 and 3 material are intended for use in all applications listed in 1.1 up to and including 280°F, except that Grade 3 is not intended for use in various polar fluids such as aqueous monoethanolamine.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Grade of material required (see 1.2).
c. O-ring PIN, or form and dimensions required (see 1.2.1, 3.2 and 3.2.1).
d. Packaging requirements (see 5.1).
e. Material Safety Data Sheet (MSDS), when required (see 6.5).
f. Toxicity conformance (see 3.7 and 6.6).
g. Off-gassing conformance (see 3.9 and 6.7).

6.3 Limited testing option. Conformance testing can be reduced provided the following criteria are met. If the product has been previously tested and the test results verified in writing by the Defense Contractor Administration Specialist (DCAS) in that area, the following tests from 4.4 can be omitted: 4.4.5, 4.4.6, 4.4.7 and 4.4.8.

6.4 Suggested formulation. Vulcanizates prepared from the formulation shown below have been found to meet the requirements of this specification:

Compounding ingredients[1]	Grade 1 parts by weight	Grade 2 parts by weight
Nordel 1040	100	100
United SPF	50	80
Protox 166	5	5
Calcium stearate	1	1
Age Rite Resin D	2	2
Sulfur	0.3	0.3
DiCup 40-C	10	10

Cure: 30 minutes at 320°F (160°C).

[1] These were the specific ingredients used when developing these formulations. Many of these ingredients are available under other brand names. It is not the intention of this listing to limit the choice of the commercial source of an ingredient or to infer that one brand is better than another.

6.4.1 The above formulations are offered only as suggestions. The Government does not guarantee that materials made from these formulations will conform to the requirements of this specification. Use of these formulations does not relieve the supplier from having his product tested for conformity with the specification.

6.5 Material safety data sheets. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. In order to obtain the MSDS, FAR clause 52.223-3 must be in the contract.

6.6 Toxicity evaluation. The NAVENVIRHLTHCEN requires sufficient information to permit a HHA of the product. Any questions concerning toxicity, information required to conduct a HHA, and requests for a HHA should be addressed to the Commanding Officer, Navy Environmental Health Center, ATTN: Hazardous Materials Department, Industrial Hygiene Directorate, 620 John Paul Jones Circle, Suite 1100, Portsmouth, VA 20378-2103.

Upon receipt of the HHA, a copy should be provided to Commander, Naval Sea Systems Command, ATTN: SEA 05M3, 1333 Isaac Hull Ave., SE, Stop 5133, Washington Navy Yard, DC 20376-5133.

6.7 Off-gassing. Materials to be installed in submarines are to be controlled to prevent off-gassing, which contaminates the atmosphere and results in health hazards to personnel or deleterious effects on machinery. These controls are accomplished through the Submarine Material Control Program, which is described in the Nuclear Powered Submarine Atmosphere Control Manual, NAVSEA Technical Manual S9510-AB-ATM-010 Rev. 2. Under the Submarine Material Control Program, all materials considered for use on submarines require certification and assignment of a usage category. Under the certification process, candidate materials are selected by Navy activities or contractors, and a request for certification is submitted to Commander, Naval Sea Systems Command, ATTN: SEA 05Z9, 1333 Isaac Hull Ave., SE, Stop 5122, Washington Navy Yard DC 20376-5122. The certification request is accompanied by detailed information, including descriptions of the material. A chemical analysis is conducted, which is normally accomplished through off-gas testing. The off-gas test is required to be conducted in a Government approved laboratory designated by the preparing activity. Information pertaining to this test requirement may be obtained from Commander, Naval Sea Systems Command, ATTN: SEA 05Z9, 1333 Isaac Hull Ave., SE, Stop 5160, Washington Navy Yard, DC 20376-5160. Based on the chemical analysis results, a usage category is assigned to the material defining whether, and to what extent, the material may be used on submarines.

6.8 Subject term (key word) listing.

Aqueous menothanolamine
O-rings
Ethylene-prophlene elastomeric
Molded
Sheets
Strips
Seals

6.9 Changes from previous issue. Margin notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Preparing activity:
Navy - SH
(Project 5330-1284)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at http://assist.daps.dla.mil.