INCH-POUND

MIL-C-82805(OS)
29 December 1989
SUPERSEDING
WS 22171A
9 December 1986
(See 6.8)

MILITARY SPECIFICATION

COMPOUND, SILICONE RUBBER, HIGH STRENGTH, TWO-PART

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 the requirements for one type of two-component, high strength silicone rubber compound suitable for long-time exposure in the temperature range of -62 to 260°C (-80 to 500°F), referred to herein as the compound.

2.1 APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 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).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Ordnance Station, Standardization Branch (3730), Indian Head, MD 20640-5000, 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 8040

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

SPECIFICATIONS

MILITARY

MIL-S-23586 Sealing Compound, Electrical, Silicone Rubber, Accelerator Required

MIL-A-46146 Adhesives-Sealants, Silicone, RTV, Noncorrosive (For Use with Sensitive Metals and Equipment)

STANDARDS

FEDERAL

FED-STD-313 Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

MILITARY

MIL-STD-129 Marking for Shipment and Storage

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from: Military Specifications and Standards, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094).

2.1.2 **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 are those cited in the solicitation.

CODE OF FEDERAL REGULATIONS (CFR)

49 CFR 100-199 Transportation

(Application for copies of CFRs should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-0001.)

2.2 **Non-Government publications.** The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those 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)

ASTM D 412 Rubber Properties in Tension (DoD adopted)

ASTM D 792 Specific Gravity and Density of Plastics by Displacement (DoD adopted)

ASTM D 903 Peel or Stripping Strength of Adhesive Bonds (DoD adopted)

ASTM D 2240 Rubber Property - Durometer Hardness (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

AMERICAN TRUCKING ASSOCIATION, INC.

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Association, Inc., Attn: Traffic Dept., 2200 Mill Road, Alexandria, VA 22314-4677.)

NATIONAL RAILROAD FREIGHT COMMITTEE

Uniform Freight Classification (UFC) 6000

(Application for copies should be addressed to the National Railroad Freight Committee, 222 South Riverside Plaza, Suite 1120, Chicago, IL 60606-5945.)

(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 **First article.** When specified (see 6.2), a sample of the compound shall be subjected to first article inspection (see 6.4) in accordance with 4.3.

3.2 **Physical properties.** The physical properties of the compound shall be in accordance with table I.

3.3 **Shelf life.** The compound specified herein shall have a shelf life of 6 months after date of shipment when stored at -18 to 29°C (0 to 85°F).

3.3.1 **Temperature excursions.** Temperature excursions above and below the storage temperature limits are permissible provided the cumulative exposure time does not exceed 15 days.

3.4 Safety.

3.4.1 **Toxic products and formulations.** The material shall have no adverse effect on the health of personnel when used for its intended purpose. Questions pertinent to this effect shall be referred by the contracting activity to the appropriate departmental medical service who will act as an advisor to the contracting agency (see 4.1.2).

3.4.2 **Material Safety Data Sheets (MSDS).** The contractor shall prepare and submit an MSDS in accordance with FED-STD-313 as specified in the contract (see 6.2 and 6.6).

TABLE I. Physical properties.

Property	Limits	
	Minimum	Maximum
Mixed Material, Uncured		
Working life, hours	2.0	-
Hardness, Shore A: Room temperature cure for 120 ± 12 hours	30	-
Flow, inch	-	1.0
Cured compound		
Tensile strength, psi	400	-
Elongation, percent	300	-
180-degree peel strength, ppi	50	-
Specific gravity at 24 ± 3°C (75 ± 5°F)	1.00	1.20

3.5 **Workmanship.** The compound shall be homogeneous and shall be free from lumps, crystals, skins, and gelled material. There shall be no separation of pigments or fillers which cannot be readily dispersed. The material shall be free from contamination and other defects which could prevent the compound from being used as intended.

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) 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 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 contractor's 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 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.

4.1.2 **Toxicological product formulations.** The contractor shall have the toxicological product formulations and associated information available for review by the contracting activity to evaluate the safety of the material for the proposed use.

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

a. First article inspection (see 4.3).

b. Quality conformance inspection (see 4.4).

4.3 **First article inspection.** First article inspection shall consist of the quality conformance inspections (see 4.4). Failure to meet all of the requirements specified herein shall be cause for rejection of the first article sample.

4.4 **Quality conformance inspection.** Quality conformance inspection shall consist of the tests specified in table II.

4.4.1 **Lot.** A lot shall consist of all the compound subject to inspection at the same time and manufactured by identical processes from one of the following:

a. A single batch (see 6.3.1).

b. A continuous process (see 6.3.2).

c. A uniform blend of batches or a uniform blend of portions from a continuous process.

TABLE II. Quality conformance inspection.

Examinations and Tests	Requirement	Method
Visual examination	3.5 and Sec 5	4.5.1
Working life	3.2	4.5.3
Hardness, room temperature cure	3.2	4.5.4
Flow	3.2	4.5.5
Tensile strength	3.2	4.5.6
Elongation	3.2	4.5.6
180-degree peel strength	3.2	4.5.7
Specific gravity	3.2	4.5.8

4.4.1.1 Lot increment. When a lot is delivered in increments, each increment shall be treated as a lot for acceptance purposes. Acceptance of an incremental shipment shall be based on data obtained from tests on lot samples and tests on incremental shipment samples.

4.4.2 Sampling.

4.4.2.1 Lot sampling at vendor. Vendor sampling shall consist of one sample selected at random from each lot. Sufficient material shall be taken to perform all tests specified herein.

4.4.2.2 Container sampling prior to delivery. Three containers shall be selected at random from each lot within 30 days of shipment. When a lot is delivered in increments, three containers shall be selected at random from each increment.

4.5 Inspection methods. The following inspection methods shall be used. Unless otherwise specified in the applicable test method, all weights, volumes, temperatures, and times shall be measured to the nearest specified unit or decimal.

NOTE: Reagent grade chemicals shall be used for chemical reactions in the conduct of all tests defined herein. Solvents and indicators may be commercial nonreagent grade materials.

4.5.1 Visual examination. Visual examination shall be made to verify conformance to the requirements of 3.5 and section 5.

4.5.2 Preparation for test.

4.5.2.1 Standard conditions. Standard conditions for the tests specified herein shall be defined as 24 ± 3°C (75 ± 5°F) and 50 ± 5 percent relative humidity.

4.5.2.2 Preparation of compound. Silicone rubber compound shall be prepared by mixing the base compound and the curing agent in accordance with the manufacturer's requirements. Weight measurement shall be accurate to ± 5 percent. Mixing shall be performed in such manner as to minimize air entrapment and shall continue until the material is uniform in color. After mixing, the material shall be degassed under a maximum vacuum of 3 inches of mercury absolute for a period of 3 minutes maximum.

4.5.2.3 Curing. For tests requiring cured specimens, the mixed compound shall be cured for 5 days minimum at standard conditions as follows:

a. Place the mixed compound in a 1/16- to 1/8-inch mold between low density polyethylene coated release paper, then place between caul plates and apply pressure to close the mold.

   CAUTION: Care should be taken to apply the pressure across the entire mold to prevent distortion of sample panel.

b. Continue the cure by applying minimum pressure to maintain a closed mold for 16 ± 8 hours.

   NOTE: It is permissible to stack molds with caul plates between each mold when more than one panel is being made.

c. Remove sample panel from mold and place on a wire rack, allowing sample panel to cure the remainder of the time prior to testing.

4.5.3 Working life. The working life shall be determined in accordance with MIL-S-23586.

4.5.4 Hardness. Hardness shall be determined as follows:

a. Obtain cured panels prepared in accordance with 4.5.2.3 and layer the panels so as to obtain a 0.25 ± 0.05-inch specimen.

b. Determine the Shore A hardness in accordance with ASTM D 2240.

4.5.5 Flow. Flow shall be determined as follows:

a. Place a flow test jig on a table with front face upward and with the plunger depressed to the limit of its travel (see figure 1).

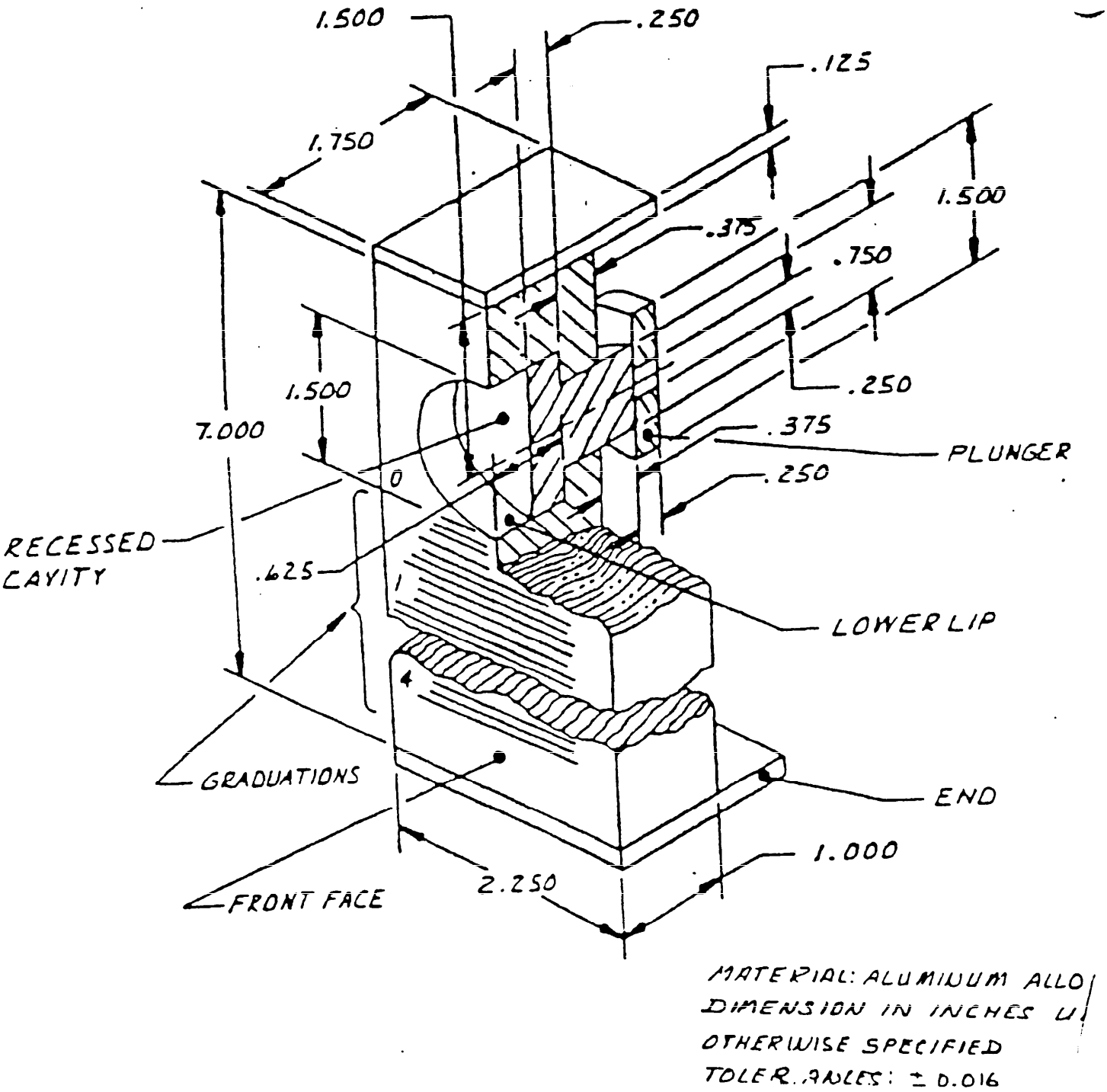

FIGURE 1. Flow test jig.

b. Mix, in accordance with the manufacturer's requirements, enough compound and curing agent to completely fill the jig cavity (82.5 ± 16.0 grams).

c. Within 5 minutes from the start of mixing, fill the recessed cavity of the jig with mixed compound until level with the front face.

d. After 10 minutes from the start of the mixing operation, place the jig on its end and immediately advance the plunger to the limit of its forward travel.

e. Leave the jig standing upright for at least 30 minutes at standard conditions.

f. Measure the flow from the lower lip of the recess to the farthest point to which the mixed compound has advanced.

4.5.6 **Tensile strength and elongation.** Tensile strength and elongation shall be determined in accordance with ASTM D 412 on dumbbell specimens cut with a die C from the cured panel prepared in accordance with 4.5.2.3.

4.5.7 **180-degree peel strength.** 180-degree peel strength shall be determined in accordance with ASTM D 903. Peel specimens shall be prepared in accordance with MIL-A-46146 using 1/4-inch-wide steel strips and a primed aluminum alloy substrate. The substrate primer shall be cured for 2 hours minimum at standard conditions.

4.5.8 **Specific gravity.** A cured sample, 1.0 ± 0.2 inch x 1.0 ± 0.2 inch (may be taken from the tensile strength test specimens) shall be tested in accordance with ASTM D 792, method A-1.

4.6 **Inspection of packaging.** The compound containers and container markings shall be visually examined to verify compliance with Section 5.

5. PACKAGING

5.1 **Packaging.** Unless otherwise specified in the contract or order (see 6.2), packaging shall be level C as specified herein.

5.1.1 **Level C.** The compound shall be packaged to afford adequate protection against loss, contamination, deterioration, and damage during shipment from the supply source to the first receiving activity and during storage under the shelf life period and conditions specified in 3.3. Containers in the same shipment shall be of the same size. The packaging shall conform to UFC 6000, National Motor Freight Classification, 49 CFR 171-178, or to other carrier rules and regulations as applicable to the mode of transportation.

5.2 **Marking.**

5.2.1 **Standard marking.** In addition to any special marking required by the contract or order (see 6.2), interior and exterior containers shall be marked in accordance with MIL-STD-129.

5.2.2 **Special marking.** In addition to the marking requirements of 5.2.1, each container marking shall include the following:

a. Title, number, and date of this specification.

b. Manufacturer's name and address.

c. Net weight of contents.

d. Shelf life expiration date.

e. Storage conditions.

f. Toxicity warning (if applicable).

g. Mixing ratio.

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 compound is intended for general use in bonding components of the Mk 104 Standard Missile Dual Thrust Rocket Motor.

6.2 **Acquisition requirements.** Acquisition documents must specify the following:

a. Title, number and date of this specification.

b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.1.2).

c. Whether first article inspection is required (see 3.1 and 6.4).

d. Material Safety Data Sheet required (see 3.4.2 and 6.6).

e. Special marking, if other than as specified in 5.2.2.

6.3 **Definitions.**

6.3.1 **Batch.** A batch is that amount of compound made as one unit in the manufacturing process.

6.3.2 Continuous process. A continuous process is an uninterrupted process of manufacture from which, in one unbroken flow, the compound is accumulated for a lot.

6.4 **First article.** When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first article sample, a first production item, a sample selected from the first production items, or a standard production item from the contractor's current inventory (see 3.1), and the number of items to be tested as specified in 4.3. The contracting officer should also 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. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.5 **Possible material.** The following material has been found to meet the requirements of this specification. This is given only for information and is not restrictive. DC 93-076 W/-2 catalyst manufactured by Dow Corning U.S.A., Midland, Michigan 48640-0997, has been found to meet the requirements of this specification.

6.6 Material Safety Data Sheets. MSDS requirements are applicable to this specification and should be specified in the contract as required by the Federal Acquisition Regulation (FAR) Part 23, subpart 23.3. Contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in FED-STD-313.

6.7 **Subject term (key word) listing.**

Rocket Motor, Dual Thrust, Mk 104
Standard Missile

6.8 **Supersedure information.** MIL-C-82805 incorporates the following engineering change proposals (ECPs), notices of revision (NORs), and specification change notices (SCNs):

ECPs	NORs	SCNs
MTA016 (10/24/86)	----	SCN 2 (10/2/86)
MTA105 (11/3/89)	MTA105.1 (11/4/89)	----

Preparing Activity:
NAVY-OS
(Project 8040-N148)

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	2. DOCUMENT DATE (YYMMDD)
	MIL-C-82805	29 December 1989

3. DOCUMENT TITLE
COMPOUND, SILICONE RUBBER, HIGH STRENGTH, TWO-PART

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. 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)

8. PREPARING ACTIVITY NAVAL ORDNANCE STATION (CODE 3730) INDIAN HEAD, MD 20640-5000

a. NAME	b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON
c. ADDRESS (Include Zip Code)	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