

MIL-S-2869B

29 SEPTEMBER 1965

SUPERSEDING

MIL-S-2869A

23 AUGUST 1957

(SEE 6.2)

MILITARY SPECIFICATION

SEALING COMPOUND, SYNTHETIC RUBBER, HOSE COVER REPAIR

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 This specification covers a two part synthetic rubber sealing compound for hose cover repair.

FED-

STD-601 — Rubber: Sampling and Testing.

MILITARY

MIL-STD-129 — Marking for Shipment and Storage.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein:

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

SPECIFICATIONS

FEDERAL

PPP-B-636 — Box, Fiberboard.

PPP-C-96 — Cans, Metal, 28 Gage and Lighter.

MILITARY

MIL-L-10547 — Liners, Case, Waterproof.

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 83rd Street, New York, N. Y. 10016.)

STANDARDS

FEDERAL

3. REQUIREMENTS

3.1 Material. The material shall be furnished in two parts as follows:

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- (a) A prepolymer of the polysulfide type.

- (b) A curing agent, which, when mixed with the polysulfide prepolymer will result in a solid synthetic rubber without the addition of heat or pressure. The resulting mixture shall meet the requirements specified herein.

3.2 Viscosity. The viscosity of the mixed compound shall be as follows when tested as specified in 4.4.1.

	<i>Grams extruded per minute</i>	
	<i>Minimum</i>	<i>Maximum</i>
30 minutes after mixing	0.5	3.0
90 minutes after mixing	0.2	—

3.3 Volatility. The volatile matter in the mixed compound shall be not more than 15 percent, when tested as specified in 4.4.2.

3.4 Adhesion to cotton duck. Adhesion of the cured material to cotton duck shall be a minimum of 5 pounds per inch, when tested as specified in 4.4.3.

3.5 Tear resistance. The tear resistance of the cured material shall be a minimum of 27 pounds per inch of thickness, when tested as specified in 4.4.4.

3.6 Hardness. The durometer hardness of the cured material shall be 50 ± 5 , when tested by the method specified in 4.4.5.

3.7 Volume change. The cured material shall not swell more than 30 percent (shrinkage not allowed), when tested as specified in 4.4.6.

3.8 Marking and instructions. Each unit container of material shall be labelled giving the name of manufacturer, nomenclature, specification number, date of manufacture, lot or batch number and the following instructions: "The damaged area of

the hose cover should be repaired as follows:

- (a) Trim away all loose rubber and bevel the edges for a distance of at least $\frac{1}{2}$ inch from the fabric with a portable grindstone.
- (b) Brush out all foreign material from the damaged area with a steel brush.
- (c) Pour the curing agent from the upper compartment into the lower can containing the liquid prepolymer compound and thoroughly mix the two.
- (d) Spread the mixed repair compound over the damaged area. Fill the cavity with the compound to a level slightly greater than the thickness of the hose cover.
- (e) Carefully wrap at least 2 layers of friction tape over the repair.
- (f) Do not disturb repair for 48 hours. It is desirable to leave the friction tape around the repair until it wears off because of the added protection against scuffing and abrasion that it affords."

3.9 Workmanship. Workmanship shall be in accordance with the best commercial practice for this class of material.

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

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the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Sampling.

4.1 Lot. For purposes of sampling, examinations and tests, a lot shall consist of all material manufactured as one production batch and offered for delivery at one time.

4.2.2 Sampling for examination of filled containers. A random sample of filled containers shall be taken in accordance with the sampling plan given in table I for the examination specified in 4.3.1.

TABLE I Sampling for examination

Lot size number of filled containers	Sample size number of filled con- tainers to be sampled	Number of defective containers	
		Major defects Accept	Total defects Accept
up to 8	all	0	0
9 to 90	5	0	1
91 to 280	13	1	3
281 to 500	20	2	5
501 to 1200	32	3	7
1201 to 3200	50	5	10

4.2.2.1 Defects defined. A major defect is a defect that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose. A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit. Total defects is major or minor defects combined. Any number of defects greater than the ap-

plicable acceptance number is a rejection number and cause for rejection of the lot represented by the sample.

4.2.3 Sampling for quality conformance tests. From each lot, two containers of prepolymer material with sufficient curing agent shall be taken at random for testing as specified in 4.3.2.

4.3 Examination and tests.

4.3.1 Examination of filled containers. Each filled container taken as specified in 4.2.2 shall be examined for fill, for defects of construction of the container and the closure, for evidence of leakage, for identification markings and instructions. Any container that is found not in conformance shall be rejected. If the number of defective or nonconforming containers in the sample exceeds the applicable acceptance number of the sampling plan in table I, this shall be cause for rejection of the lot represented by the sample.

4.3.2 Quality conformance tests. The containers of material taken in accordance with 4.2.3 shall be separately subjected to the tests specified in 4.4. If either is found to be not in conformance with this specification, it shall be cause for rejection of the lot represented by the sample.

4.4 Test procedures.

4.4.1 Viscosity.

4.4.1.1 Apparatus. The apparatus shall consist of the following:

- A $\frac{1}{2}$ -inch pipe $2\frac{1}{2}$ inches long with a 0.070-inch diameter orifice, fitted as shown in figure 1.
- Compressed air supply.
- Stop watch.

4.4.1.2 Procedure. The following proce-

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ture shall be used for determining the viscosity of the material:

- (a) Mix the curing agent with the liquid prepolymer compound.
- (b) After completing the mixing fill the pipe and assemble the viscosimeter as shown in figure 1.
- (c) Connect the viscosimeter to the compressed air supply.
- (d) Exactly 30 minutes after mixing, start the flow of the material through the orifice by closing the exhaust valve and opening the air supply. The air pressure shall be 10 pounds per square inch gage.
- (e) After a few grams of material have been extruded, close the air supply valve and open the exhaust valve simultaneously.
- (f) Remove the material which has been extruded and place a weighed container beneath the orifice.
- (g) Repeat the operations in (d) and (e), allowing the material to extrude for exactly one minute.
- (h) Weigh the container and extruded material, subtract the weight of the container to determine the weight of the material extruded in one minute.
- (i) Operations (b) through (h) inclusive should be performed in prompt consecutive order with no holding periods.
- (j) Exactly 90 minutes after mixing the compound, the viscosity of the compound shall again be de-

termined as detailed in (g) and (h) above.

- (k) This test shall be conducted at a temperature of $23^{\circ} \pm 5^{\circ}\text{C}$ ($73.4^{\circ} \pm 9^{\circ}\text{F}$).

4.4.2 Volatility. The following test for volatility shall be conducted on the freshly mixed polymer compound and curing agent:

- (a) Spread about 1 gram of the mixed material in a layer approximately 1/16-inch thick in a weighed crucible.
- (b) Reweigh the crucible and contents within 2 minutes.
- (c) Place crucible in a circulating air oven for $24 \pm \frac{1}{4}$ hours at $110^{\circ} \pm 2^{\circ}\text{C}$ ($230^{\circ} \pm 3.6^{\circ}\text{F}$).
- (d) Remove the crucible, place in a desiccator, and allow it to cool to room temperature before reweighing.
- (e) The loss in weight expressed as a percentage of the initial weight of the sample shall be taken as a measure of the volatility of the material.

4.4.3 Adhesion.

4.4.3.1 Test specimens. Three 2 by 6-inch test specimens shall be prepared as follows:

- (a) Apply a 3/16-inch layer of the freshly mixed material to three pieces of cotton duck (hard texture cotton duck weighing not less than 18 ounces per square yard).
- (b) Cover with three additional pieces of cotton duck and roll down gently.

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- (c) Allow the assembled specimens to lay on a flat surface for $48 \pm \frac{1}{2}$ hours at $23^\circ \pm 5^\circ\text{C}$ ($73.4^\circ \pm 9^\circ\text{F}$).

4.4.3.2 Procedure. After the 48 hour period, the upper layer of cotton duck shall be removed from the specimens and adhesion between the remaining layer of duck and the cured material shall be determined in accordance with method 8011 of FED-STD-601.

4.4.4 Tear resistance. Three test specimens shall be prepared by pouring the mixed material into a 3 by 6-inch frame resting on glass, polyethylene film, or cellophane. After $48 \pm \frac{1}{2}$ hours at $23^\circ \pm 5^\circ\text{C}$ ($73.4 \pm 9^\circ\text{F}$), tear resistance shall be determined by method 4211 of FED-STD-601. Three die B specimens, 0.100 ± 0.010 inch thick shall be used.

4.4.5 Hardness. The hardness of the cured material shall be determined with a Shore A durometer according to method 3021 of FED-STD-601. The 3-second reading shall be taken. The test specimens shall be $5/16 \pm 1/16$ inch thick cast plugs of the mixed material which have been aged at least 48 hours at $23^\circ \pm 5^\circ\text{C}$ ($73.4 \pm 9^\circ\text{F}$).

4.4.6 Volume change. The volume change shall be determined in accordance with method 6211 of FED-STD-601 using Medium No. 5 fuel as specified in method 6001 of FED-STD-601.

4.5 Examination of preparation for delivery. The packaging, packing, and marking shall be examined for compliance with section 5 of this document.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C, as specified (see 6.1).

5.1.1 Level A. The sealing compound shall be furnished in 1 pint double com-

partment metal cans or single compartment metal cans with a separate glass or plastic container for the liquid curing agent. If a separate container is provided for the curing agent it shall be packaged with one base compound container in a manner which will prevent accidental separation, but will permit easy separation for mixing purposes. The ratio of the quantity contained in the base container (or compartment) to the quantity contained in the curing agent container (or compartment) shall be the same as the recommended mixing ratio of the base compound and curing agent.

5.1.1.1 Cans. Cans shall conform to type V, class 2 of PPP-C-96. Exterior plan B coating and side seam striping shall be required. All cans shall be provided with sufficient outage to permit thorough mixing of the approximate amount of curing agent.

5.1.1.1.1 Compartmented cans. Cans with two compartments shall also conform to the following:

- (a) Lower compartments shall consist of 1 pint multiple friction top cans made from special manufacturer's terneplate.
- (b) Upper compartments shall be approximately $3\text{--}7/16$ inches diameter by 1 inch high multiple friction top cans made from special coated manufacturer's terneplate. The bottom shall have an annular projection specifically designed to fit a corresponding annular groove in the multiple friction top of the lower compartment. If necessary the interior of the can shall be coated such that it is not attacked by the curing agent.

5.1.1.2 Glass and plastic containers. Commercial wide-mouth glass and plastic containers may be used for packaging the curing agent when single compartment cans are used for the liquid polymer of the com-

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pound. The containers shall have vertical, smooth inside walls, no internal projections or internal lips exceeding 1/16 inch. The container shall be provided with a screw cap enclosure fitted with a non-absorbent liner. The container must not effect or be effected by the packaged contents. A gasket which does not effect and is not effected by the packaged contents shall be provided to assure an airtight seal between the screw cap and the container.

5.1.2 Level C. Packaging shall be sufficient to afford adequate protection against corrosion, deterioration, and physical damage during shipment from supply source to the using activity and until early material use.

5.2 Packing. Packaging shall be level A, B or C, as specified (see 6.1).

5.2.1 Level A.

5.2.1.1 Cans. Cans shall be arranged and packed for overseas shipment in accordance with the appendix to PPP-C-96. Shipping containers shall have case liners conforming to MIL-L-10547 and appendix thereto. In addition boxes shall be fitted with cell partitions, and tiers of cans shall be separated with corrugated board. Unless otherwise specified, the gross weight of wood boxes shall not exceed 200 pounds; fiberboard boxes shall not exceed the weight limitations of the applicable box specification.

5.2.1.2 Level B.

5.2.1.2.1 Cans. Cans shall be arranged and packed for domestic shipment in accordance with the appendix to PPP-C-96. Cans packed in tiers shall have a 200 pound minimum bursting strength fiberboard pads

placed between tiers. Fiberboard pads shall conform to PPP-B-636, class 1. Closures shall be as specified in the applicable box specification or appendix thereto.

5.2.1.3 Level C. 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.

5.3 Marking. In addition to any special marking required by the contract or order or herein (see 3.8) interior packages, shipping containers shall be marked in accordance with MIL-STD-129. The date of manufacture and both the manufacturer's product number and batch number shall be included in the marking information.

6. NOTES

6.1 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Level of packaging and packing required (see 5.1 and 5.2).
- (c) Special marking required (see 5.3).

6.2 Changes from previous issue. The extent of changes (deletions, additions, etc.) preclude the annotation of the individual changes from the previous issue of this document.

Custodians:

Army — MR
Navy — SH

Review activities:

Army — MR, WC
Navy — SH

User activities:

Army — GL, MO
Navy — MC

Preparing activity:

Navy — SH
(Project 8030-0140)

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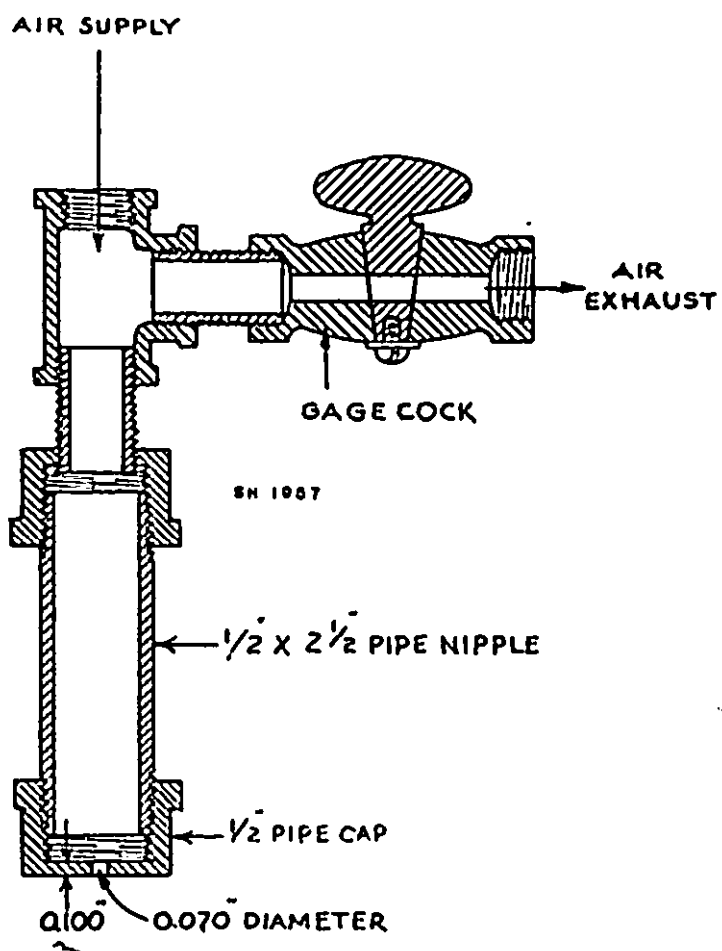


FIGURE 1. Viscosity test apparatus.

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SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
<p style="text-align: center;"><u>INSTRUCTIONS</u></p> <p>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 Department of Defense. 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 lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).</p>		
SPECIFICATION		
ORGANIZATION (Of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> 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?		
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE