

MIL-A-13881C
10 October 1983
SUPERSEDING
MIL-A-13881B
7 June 1965

MILITARY SPECIFICATION

ANTI-SEIZE COMPOUND, MICA-BASE (FOR THREADED FITTINGS)

This specification is approved for use by the Army Materials and Mechanics Research Center, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers one type of mica-base anti-seize compound, for use on the threads of automotive engine spark plugs, and in other applications involving high temperatures.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

RR-S-366 - Sieves, Standard for Testing purposes
PPP-C-96 - Cans, Metal, 28 Gage and Lighter

STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129 - Marking for Shipment and Storage

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Director, US Army Materials and Mechanics Research Center, ATTN: DRUMR-SMS, Watertown, MA 02172 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D 92 - Test for Flash and Fire Points by Cleveland Open Cup
 ASTM D 97 - Test for Cloud and Pour Points
 ASTM D 270 - Sampling Petroleum and Petroleum Products
 ASTM D 445 - Test for Kinematic Viscosity

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal Agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Material. The anti-seize compound shall consist of a composition of refined petroleum oil (see 3.2) and mica (see 3.3) with the percentage of each as specified in Table I.

Table I. Composition

Ingredients	Percent by weight	
	Minimum	Maximum
Oil	55	62
Mica	38	45

3.2 Properties of the oil ingredient. The oil ingredient of the anti-seize compound shall be a refined petroleum oil without the admixture of fatty oils, resins, rubber, hydrocarbons, soaps, or other additive compounds not naturally occurring in petroleum, and shall conform to the following requirements:

3.2.1 Color. The color of the oil ingredient shall be dark green or amber (see 4.4).

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3.2.2 Viscosity. The kinematic viscosity of the oil ingredient at 98.9°C (210°F) shall be not less than 62.5 nor more than 71.2 centistokes when tested as specified in 4.5.2.

3.2.3 Flash point. The flash point of the oil ingredient shall be not lower than 315°C (599°F) when tested as specified in 4.5.2.

3.2.4 Pour point. The pour point of the oil ingredient shall be not higher than 1.7°C (35°F) when tested as specified in 4.5.2.

3.3 Properties of mica ingredient.

3.3.1 Color. The mica ingredient of the anti-seize compound shall be white, light gray or light brown in color (see 4.4).

3.3.2 Fineness. All of the mica used in the compound shall pass through a U.S. Standard 149-micron (No. 100) sieve when tested as specified in 4.5.3.1.

3.3.3 Uniformity. The mica shall consist of flakes of uniform appearance. No appreciable quantity of particles of different size, shape, or appearance shall be present. The mica shall consist of flat, transparent plates, without the admixture of appreciable quantities of foreign material. Tests shall be made in accordance with 4.5.3.2.

3.4 Workmanship. Workmanship shall be in accordance with good commercial practice covering this class of material. The compound shall be free from cakes or lumps.

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 as 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 assure supplies and services conform to prescribed requirements.

4.2 Lot. A lot shall consist of all anti-seize compound from the same batch or blending operation, subjected to the same processing operations and conditions and produced by one manufacturer and offered for delivery at one time.

4.3 Sampling.

4.3.1 For examination. Unless otherwise specified a random sample of filled containers shall be selected for examination in accordance with level I or MIL-STD-105.

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Table II - Classification of defects

Item	AQL percent	Classification of defects	Defect	Method of inspection
Anti-seize compound (see 4.3.1, 3.2.1, 3.3.1 and 3.4)	2.5	Major 101	Wrong color oil	Visual
		Major 102	Wrong color mica	Visual
		Major 103	Compound not free from cakes or lumps	Visual
Unit container (see 4.3.1 and 5.1 scale ^{2/})	2.5	Major 104	Improper type	Visual
		Major 105	Improper size	Visual
		Major 106	Improper fill ^{1/}	Approved
		Major 107	Leakage	Visual
Major 108	Improper closure	Visual		
Box open (see 4.3.1 and 5.2)	2.5	Major 109	Improper type ^{3/}	Visual
		Major 110	Lack of, or improper strapping	Visual
Box closed (see 4.3.1, scale ^{2/} and 5.3)	2.5	Major 111	Gross weight, max.	Approved
		Major 112	Improper marking	Visual
		Major 113	Improperly closed	Visual

^{1/}the actual weight of a container filled with the minimum required quantities of anti-seize compound

shall be the basis for determining the acceptable weight of subsequent containers.

^{2/}approved by procuring activity

^{3/}when applicable

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4.3.2 For tests. Prepare a representative 1-quart sample from the lot of the anti-seize compound for the composition test (4.5.1). Obtain an "average sample" of oil in accordance with ASTM Method D 270 for compliance with 4.5.2. Select a representative sample of mica used in the anti-seize compound for compliance with 4.5.3.

4.4 Examination. Sample units selected in accordance with 4.3.1 shall be examined for the defects and at the acceptable quality level shown in Table II.

4.5 Tests.

4.5.1 Composition. Fifty grams, weighing within \pm 0.1 gram, of the compound shall be mixed with 4 or 5 times the volume of toluene and centrifuged or allowed to stand until the supernatant liquid is completely clear. The liquid shall then be carefully decanted. This procedure shall be repeated until the toluene extract is colorless. If preferred, a Soxhlet apparatus of suitable size may be used and the sample extracted with toluene until the liquid siphoning over is colorless. The portion insoluble in toluene shall be dried completely free from toluene and shall be weighed and reported as mica. The toluene extracts shall be evaporated over steam until no toluene remains as indicated by a constant weight. The weight of the oil shall be reported as the difference between the weight of the mica and the weight of the original sample.

4.5.2 Tests for oil portion. The following tests shall be made on the oil ingredient of the anti-seize compound in accordance with the indicated methods.

Table III - Tests for oil portion

Test	Requirement paragraph	ASTM designation
Viscosity	3.2.2	D 445-64
Flash point	3.2.3	D 92-57
Pour point	3.2.4	D 97-57

4.5.3 Tests on the mica portion

4.5.3.1 Fineness. A 3-inch 149 micron (No. 100) sieve, conforming to RR-S-366, shall be dried for 1 hour in an oven at 105° to 110°C (221° to 230°F). The sieve shall be cooled and weighed accurately. A 10-gram sample of mica shall then be transferred to a beaker, 200 ml of hot water added, and the mixture poured through the sieve, catching all the liquid and solid matter passing through the sieve in clean beakers. The mica shall be washed from the beakers onto the sieve with hot water. The sieve shall be washed with successive 200-ml portions of hot water until the water passing through the sieve into a clean 400-ml beaker shows no solid particles at the bottom of the beaker, after the liquid has been vigorously stirred and the beaker placed on a black surface.

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If the material forms lumps or aggregates upon washing with water, a camel's hair brush may be used on the sieve. The sieve shall be weighed after it has again been dried for 1 hour at 105 to 110°C (221 to 230°F) in an oven, and cooled. The weight of the sieve shall not exceed that of the dry sieve at the beginning of the test.

4.5.3.2 Uniformity. The mica shall be examined under a magnification of 50 diameters to determine the size uniformity of the flakes.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A. Unless otherwise specified, anti-seize compound shall be furnished in type V, class 2 containers of PPP-C-96, of capacity specified in the contract or order. Closure of filled containers shall be in accordance with Appendix of PPP-C-96. Containers shall be packaged in accordance with the Appendix to PPP-C-96 when required by the appendix.

5.1.2 Level C. The anti-seize compound shall be packaged in accordance with the supplier's commercial practice. Protection shall be such as to prevent deterioration during shipment and to ensure safe delivery at destination.

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

5.2.1 Level A. Containers shall be packed in accordance with the overseas shipment requirements of the appendix to PPP-C-96.

5.2.2 Level B. Containers shall be packed in accordance with the domestic shipment requirements specified in the appendix to PPP-C-96.

5.2.3 Level C. The anti-seize compound shall be packed for shipment in compliance with common regulations applicable to that mode of transportation to ensure safe delivery at destination at lowest transportation costs without assessment of penalty charges for improper packing.

5.3 Marking. The unit containers and the exterior shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. The anti-seize compound, being a nonconductor of electricity and possessing high heat resistance, is particularly suitable for use on automotive engine spark plugs. It may also be used in other applications involving high temperatures. However, because of its insulating properties, it should not be used where mating parts are required to be in good electrical contact.

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6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Quantity desired.
- c. Size of container required (see 5.1).
- d. Required levels of packaging (see 5.1) and packing (see 5.2).

Custodian:

Army - MR
Air Force - 99

Preparing activity:

Army - MR

Project No. 8030-0503

Review Activities:

Army - ME, MI
Air Force - 84

User activities:

Navy - SH

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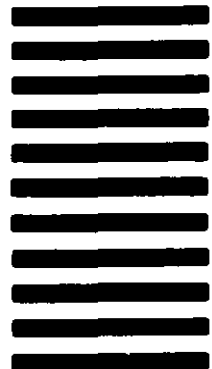
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