

O-A-549A

March 3, 1973

SUPERSEDING

Int. Fed. Spec. O-A-549 (GSA-FSS)

August 29, 1969

FEDERAL SPECIFICATION

ANTI-FOGGING COMPOUND

This specification was approved by the Commissioner, Federal Supply Service, General Service Administration, for the use of all Federal agencies.

1. SCOPE

1.1 Scope. The compound covered in this specification shall be of one grade, and is intended to prevent fogging on all transparent or reflective surfaces.

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.

Federal Specifications:

TT-E-489 - Enamel, Alkyd, Gloss (For Exterior and Interior Surfaces).
GGG-G-531 - Goggles, Industrial (Eyecup); and Lens, Goggles, Industrial.
PPP-B-636 - Box, Fiberboard.

Federal Standard:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).
Fed. Std. No. 313 - Symbols for Packages and Containers for Hazardous Industrial Chemicals and Materials.

(Activities outside the Federal Government may obtain of Federal Specifications, Standards and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies).

Military Standards:

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

(Copies of Military Specifications and Standards required by supplier in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

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2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM) Standard:

D1310 - Flash Point of Volatile Flammable Materials by Tag Open-Cup Apparatus.

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

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Association, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 S. Riverside Plaza, Chicago, IL 60606.)

3. REQUIREMENTS

3.1 Abrasive materials. When tested as specified in 4.4.1, compound shall contain no abrasive materials.

3.2 Non-injurious nature. When tested as specified in 4.4.2, compound shall not be injurious to paint, upholstery, fabrics, rubber or clothing. It shall not pit, etch or distort glass or plastic when tested as specified in 4.4.2.

3.3 Non-irritant nature. When tested as specified in 4.4.3, the compound shall be non-irritating.

3.4 Minimum application temperature. When tested as specified in 4.4.4, compound shall remain suitable for application according to manufacturers instructions at 21°F.

3.5 Flash point. The compound shall have a flash point (tag open cup) of not less than 140°F., when tested as specified in 4.4.5.

3.6 Duration of anti-fogging action. The compound shall give effective fog prevention for a minimum of 48 hours at a temperature of 10°F. (-12.2° C.) when tested on glass surfaces. The compound shall give effective fog prevention for a minimum of 24 hours at 40°F. (4.4° C.) when tested on plastic surfaces. Both tests shall be carried out in accordance with method described in 4.4.6.

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

4.2 Sampling for inspection and acceptance. Sampling for inspection and acceptance shall be performed in accordance with the provisions set forth in MIL-STD-105, except where otherwise indicated. For purposes of sampling, an inspection lot for examination and tests shall consist of all material submitted for delivery at one time. The inspection level shall be S-2, with an AQL of 2.5 expressed in terms of defects per hundred units.

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4.3 Examination of preparation for delivery. An examination shall be made to determine whether packaging, packing and marking comply with the requirements of section 5. Defects shall be scored as specified in table I. Sampling shall be in accordance with MIL-STD-105. The sample unit shall be one container fully prepared for delivery. The lot shall be the number of containers offered for inspection at one time. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of defects per hundred units.

TABLE I. Examination of preparation for delivery.

Examine	Defect
Containers	Not as specified.
Contents	Not as specified.
Marking	Omitted, incorrect; illegible; improper size, location, sequence or method of application.
Materials	Component missing or damaged.
Workmanship	Bulging or distortion of containers. Cushioning inadequate, improper or missing.

4.3.1 Examination for closure of shipping containers. When shipping containers are required to be in accordance with PPP-B-636, examination for defects in closure shall be in accordance with the appendix of that specification.

4.4 Test methods.

4.4.1 Test for abrasive material. Prepare two clean 4 X 4 inch pieces of vehicle safety glass. Pour 1-2 ml of the compound on one, holding it level, and place the second on top of it, forcing the excess liquid off the edge of the glass. Rotate the two plates 360° at least four times and listen and feel for any evidence of abrasion. Slide them apart, wash them with distilled water and allow to dry. Examine visually for scratches. Any evidence of abrasion shall be cause for rejection.

4.4.2 Test for non-injurious nature.

4.4.2.1 Spotting or staining. Spatter panels of white and black enamel conforming to TR-E-489 with the compound, and allow to dry. Wet one corner of swatches of upholstery material, including the vinyl leatherette, wool, cotton and nylon fabric and rubber sheet, and allow to dry. Allow to stand overnight and inspect visually for evidence of damage of spotting. Wash off the paint panels and rubber and launder the fabrics. Reexamine for evidence of damage or spotting. Evidence of damage or spotting shall be cause for rejection.

4.4.2.2 Pitting or etching. Place samples of glass and Plexiglas in a beaker half filled with compound and evaporate to dryness in an oven 135° + 2° F. Wash off samples with distilled water and examine visually for evidence of pitting or etching. Evidence of pitting or etching shall be cause for rejection.

4.4.3 Lacrimation test. Apply the material to the inside left surface of regular goggles conforming to GGG-G-513, type I, class A (PSN 4240-269-7911) in accordance with manufacturers instructions. The goggles shall be cooled to approximately 50°F., and placed on at least 3 volunteers in an atmosphere of 70° to 75° F. and 60 to 70 percent relative humidity. The goggles shall be worn for a period of 30 minutes, during or after which there shall be no evidence of irritation or lacrimation.

4.4.4 Test for application temperature. Place container of compound in a cold chamber maintained at 21° F. + 2° F. for 24 hours. At the end of that time, the compound shall be suitable for the application according to manufacturers instructions.

4.4.5 Flash point. Flash point shall be measured in accordance with ASTM D1310.

4.4.6 Test for duration of anti-fogging action.

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4.4.6.1 Apparatus for testing. The apparatus for testing shall consist of four panels (minimum dimensions 3 in. X 4 in.) mounted in a suitable partition of plywood or Styrofoam. Two panels shall be 1/8" Plexiglas and two panels shall be vehicle safety glass. If tape is used to secure the panels to the partition, enough margin shall be used so that the tape is at least 1/2" from the area being evaluated. The partition holding the panels shall be used to divide an environmental simulation chamber into two sections. For the vehicle safety glass, one section shall be maintained at $10^{\circ} + 2^{\circ}$ F. ($-12.2^{\circ} + 1^{\circ}$ C.) while the other section is maintained at $75^{\circ} + 2^{\circ}$ F. ($23.9^{\circ} + 1^{\circ}$ C.) with a relative humidity of 80 percent \pm 5 percent. The Plexiglas panels shall be tested at $40^{\circ} + 2^{\circ}$ F. ($4.4^{\circ} + 1^{\circ}$ C.) against the same temperature and humidity used with the vehicle safety glass panels. The chamber shall have a view port and an internal light so that the test panels may be observed while the test is in progress (see 6.1).

4.4.6.2 Preparation of panel. The panels are sprayed with antifog compound and wiped dry with facial tissue. After a five minute interval this step is repeated.

4.4.6.3 Test procedure. After the panels have been prepared, and the partition is in place with the treated surfaces of the panels facing the warm humid side, the warm humid side of the environmental chamber is turned on. Once the temperature and humidity are at the specified levels, the cold side of the chamber is turned on. The testing period shall begin when the cold side of the chamber begins controlling at the temperature specified in 4.4.6.1. The test panels shall remain free of fog.

4.4.6.4 Recording. Temperature and humidity shall be continuously recorded by an automatic recording device for the duration of the test.

5. PREPARATION FOR DELIVERY

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

5.1.1 Level B.

5.1.1.1 Unit packaging.

5.1.1.1.1 3-1/2 ounce quantity. The anti-fogging compound shall be packaged in a plastic squeeze bottle type dispenser commercially used for the product.

5.1.1.1.2 1 pint quantity. The anti-fogging compound shall be packaged in a glass or plastic bottle with dispenser commercially used for the product.

5.1.1.2 Intermediate packaging. Twelve unit packages shall be packaged in a close-fitting box conforming to PPP-B-636, class domestic. The box shall be provided with half-slotted partitions of the full height of the box to provide individual cells for the bottles.

5.1.2 Level C. The anti-fogging compound shall be packaged to afford adequate protection against damage during shipment from the supply source to the first receiving agency.

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

5.2.1 Level B. Six intermediate packages (72 bottles) of 3-1/2 ounce containers or two intermediate packages (24 bottles) of 1 pint containers shall be packed in a box conforming to PPP-B-636, class domestic.

5.2.2 Level C. The anti-fogging compound in quantities as specified (see 6.2) packaged as specified in 5.1 shall be packed in containers to assure carrier acceptance and safe arrival at destination in compliance with Uniform Freight Classification or National Motor Freight Classification.

5.3 Marking. In addition to any special marking required in the procurement documents, marking of the interior packages and exterior shipping containers shall be in accordance with Fed. Std. No. 123 for civil agencies of MIL-STD-129 for military agencies, as applicable (see 6.2), and Fed. Std. 313.

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6. NOTES

6.1 A number of commercial devices are available to carry out the required testing. One example is the High Temperature-Low Temperature Humidity Test Chamber, Model LHH-27, manufactured by Associated Testing Laboratories, Northwest Industrial Park, Burlington, Massachusetts 01803.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- (a) Title, number, and date of this specification.
- (b) Quantity required (see 5.1.1.1 and 5.2.2).
- (c) Level of packaging and packing (see 5.1 and 5.2).
- (d) Marking document required (see 5.3).

MILITARY INTERESTS:

Army - MU
Navy - SH
Air Force - 68

CIVIL AGENCY INTERESTS:

GSA - FSS
VA - DMS

Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See Section 2 of this specification to obtain extra copies and other documents referenced herein. Price 10 cents each.