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RR-A-1147B
June 13, 1980
SUPERSEDING
Fed. Spec. RR-A-1147A
November 3, 1969

FEDERAL SPECIFICATION

# ARM, WINDSHIELD WIPER: BLADE, WINDSHIELD WIPER: AND BLADE REFILL, WINDSHIELD WIPER (VEHICULAR)

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

## 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers windshield wiper arms, blades, and blade refills for use on automotive vehicles (see 6.1).

1.1.1 Federal specification coverage. Federal specifications do not include all varieties of the commodity indicated by the title of the specification, or which are commercially available, but are intended to cover only those generally used by the Federal Government.

1.2 Classification. Windshield wiper arms, blades, and blade refills shall be furnished in the following types, classes, and styles, as specified (see 6.2).

| | |
|---|---|
| Type I | - Windshield wiper arms |
| Class A | - Light duty |
| Class B | - Heavy duty |
| Type II | - Windshield wiper blades |
| Class A | - Light duty |
| Class B | - Heavy duty |
| Style 1 | - Flat |
| Style 2 | - Curved |
| Type III | - Windshield wiper blade refills |
| Class A | - Light duty |
| Class B | - Heavy Duty |
| Style 1 | - Flat |
| Style 2 | - Curved |

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2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issues 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-C-490 | - Cleaning Methods and Pretreatment of Ferrous Surfaces for Organic Coatings. |
| TT-P-636 | - Primer Coating, Alkyd, Wood and Ferrous Metal. |
| PPP-B-636 | - Box, Shipping, Fiberboard. |

Federal Standard:

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

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Instructions in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly 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, other Federal specifications, and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston; New York; Washington, DC; Philadelphia; Atlanta, Chicago; Kansas City, MO; Fort Worth; Houston; Denver; San Francisco; Los Angeles; and Seattle, WA.

(Federal Government activities may obtain copies of Federal specifications, standards, and commercial item descriptions, and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies.)

Military Specifications:

| | |
|---|---|
| MIL-D-13570 | - Dust, Testing by Exposure to. |
| MIL-E-52798 | - Enamel, Alkyd, Camouflage. |
| MIL-E-52835 | - Enamel, Modified, Alkyd, Camouflage, Lusterless. |

Military Standards:

| | |
|---|---|
| MIL-STD-105 | - Sampling Procedures and Tables for Inspection by Attributes. |
| MIL-STD-130 | - Identification Marking of US Military Property. |
| MIL-STD-193 | - Painting Procedures, Tactical Vehicles (Tracked and Wheeled). |
| MIL-STD-1188 | - Commercial Packaging of Supplies and Equipment. |



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| | |
|---|---|
| MS53048 | - Blade, Windshield Wiper, Lt. Duty. |
| MS53049 | - Arm, Windshield Wiper, Adjustable, Light Duty. |
| MS500090 | - Arm, Windshield Wiper, Heavy Duty (Adjustable). |
| MS500091 | - Blade, Windshield Wiper, Heavy Duty. |

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

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.

Department of Transportation (DOT):

Federal Motor Vehicle Safety Standards (FMVSS):

| | |
|---|---|
| FMVSS 104 | - Windshield Wiping and Washing Systems - Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses. |
| FMVSS 107 | - Reflecting Surfaces - Passenger Cars, and Buses. |

(Application for copies should be addressed to the Department of Transportation, Federal Highway Administration, Washington, DC 20591.)

Society of Automotive Engineers, Inc. (SAE):

| | |
|---|---|
| SAE J903 | - Passenger Car Windshield Wiper Systems. |
| SAE J198 | - Windshield Wiper Systems-Trucks, Buses, and Multipurpose Vehicles. |

(Application for copies should be addressed to the Society of Automotive Engineers, Inc. 400 Commonwealth Drive, Warrendale, PA 15096.)

National Motor Freight Traffic Association, Inc., Agent:

National Motor Freight Classification

(Application for copies should be addressed to the American Trucking Associations, Inc., Traffic Department, 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 South Riverside Plaza, Chicago, IL 60606.)

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3. REQUIREMENTS

3.1 First article. When specified (see 6.2), the contractor shall furnish sample units for first article inspection and approval (see 4.4 and 6.3). First article samples shall be inspected by the contractor under the surveillance of the Government to determine conformance to the quality assurance provisions of this specification. First article samples shall be fully representative of units to be supplied from production tooling and facilities.

3.2 Materials. Materials used in the fabrication of windshield wiper assembly shall be as specified herein and in accordance with applicable specifications and drawings (see 6.4).

3.2.1 Ozone resistance. Rubber components shall show no cracks, breaks, or pinholes after 168 hours exposure of blades for military use and after 72 hours exposure of blades for Federal agency usage. No tackiness shall develop that will cause the rubber to adhere to the windshield or the plies to adhere to each other.

3.2.2 Chemical resistance. Wiper blade elements shall meet chemical resistance requirements of SAE J903 or SAE J198, as applicable, in conformance with Federal Motor Vehicle Safety Standard No. 104.

3.3 Construction. Unless otherwise specified (see 6.2), details of attachment, and overall dimensions shall be as shown on applicable drawings or MS53048, MS53049, MS500090, and MS500091, respectively.

3.3.1 Class A (light duty). Arm, blade and wiping element, and blade refills normally used on passenger cars, station wagons and light truck type vehicles, shall meet the requirements of MS53048 and MS53049.

3.3.2 Class B (heavy duty). Arm, blade and wiping element, and blade refills normally used on commercial trucks, buses, construction and tactical type vehicles, shall be of heavier material and shall meet the requirements of MS500090 and MS500091.

3.3.3 Wiper blade. The wiper blade shall be of the length and style specified in the contract or purchase order (see 6.2). The blade shall be provided in a size range of lengths from 7-1/4 to 20 inches, with the dimensional range of sizes most used being 8, 10, 12, 14, 16, 18, and 24 inches as original equipment replacement. The blade shall include designs that are applicable to both flat and curved windshield styles. Blade hook or other means of connection to the arm shall be suitable to attach to, and function with, the wiper arms. Unless otherwise specified, (see 6.2), military wiper blades shall be in accordance with MS53048 and MS500091.

3.3.3.1 Wiper blade wiping element. Wiping element of the wiper blade may be molded, extruded, or of 5-ply rubber construction.

3.3.3.2 Adapters. Unless otherwise specified (see 6.2), adapters permitting interchangeability of wiper blades to wiper arms of other manufacture shall be furnished with each blade and necessary items such as nuts and washers, permitting interchangeability of wiper arms to wiper motors, shall be furnished with each arm.

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3.3.4 Wiper arm. Unless otherwise specified (see 6.2), extendable, fixed, and pantograph wiper arms shall be in the size range from 7-1/2 to 24 inches, with the dimensional range of sizes most used for original equipment replacement being 10, 12, 14, 16, 18, 20, 22, and 24 inches. The extendable wiper arms shall be adjustable within each stated effective length. The adjustment shall not be affected or changed as a result of operating the wiper system. Details of attachment shall include commercially used retainers or head assemblies for knurled, serrated, threaded, flat taper, or pinned shafts. An adjustable connector hook shall be provided on the end of the arm to enable right-and left-hand operation. The military wiper arm details of attachment and overall dimensions shall be as shown on applicable drawing or MS53049 and MS 500090.

3.3.5 Interchangeability. All arm and blade assemblies shall be interchangeable with all other assemblies having the same part number.

3.4 Performance. All arms, blade and wiping elements, and blade refills shall meet the performance requirements specified in SAE J903, or SAE J198, as applicable, plus the following additional requirements. In the event of conflict between military requirements, and the forgoing SAE requirements, the military requirements shall prevail.

3.4.1 Wiped area.

3.4.1.1 Passenger cars. Minimum wiped area of passenger car windshields shall be as specified in Federal Motor Vehicle Safety Standard (FMVSS) 104. The wiped area shall contain no streaks, nor drag of water, extending more than 10 degrees from either end of the wiping arc.

3.4.1.2 Trucks and other vehicles. Wiped area of the windshield of trucks and other vehicles shall contain no streaks, nor drag of water and dust solution, extending more than 10 degrees from either end of the wiping arc illustrated in figure 1.

3.4.2 Wiper blade pressure. Wiper blade shall fully contact the windshield glass throughout its length. Contact pressure of the blade against the glass shall be a minimum of 1.0 ounce for each inch of wiper blade length, at median arm position.

3.4.3 Wiper arm resistance to push and pull. Position of the wiper arm in relation to the drive shaft shall not change, when subjected to a push or pull of 2 pounds against the free end of the arm, in its normal direction of travel.

3.4.4 Wiping element retention. Wiping element of the wiper blade assembly and wiper blade refills shall be so held that it shall not pull out or separate from the blade assembly under all conditions of operation. It shall withstand a direct pull in the major plane of the blade, and at right angles to the major axis of the blade, of not less than 15 pounds without separating from the metal frame of the blade assembly.

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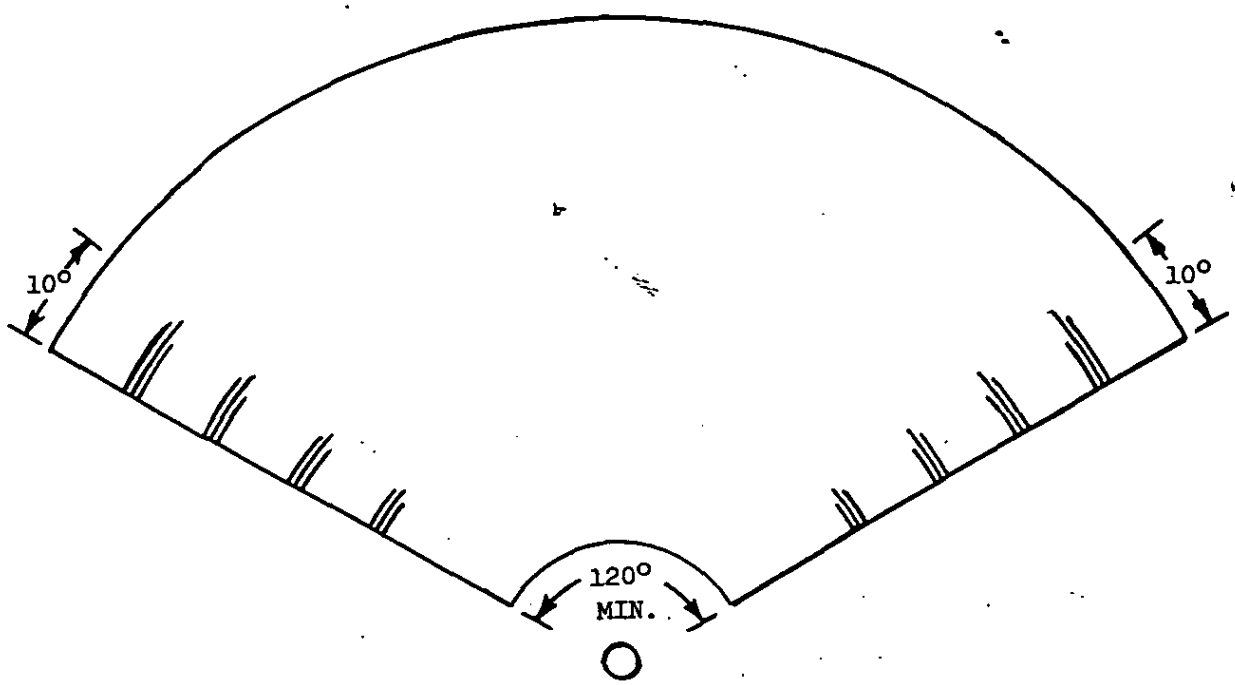


FIGURE 1. Acceptable cleaning pattern.

3.4.5 Temperature resistance. Federal agency arms, blades and refills shall meet the temperature resistance requirements of SAE J903. Military arms, blades and refills shall meet the following requirements:

3.4.5.1 Low temperature. Rubber components of the wiper blade shall withstand an ambient air temperature of minus 20°F (+3° -0°) and shall evidence no cracks, fissures, crazing or rupture.

3.4.5.2 High temperature. Rubber components of the wiper blade shall withstand am ambient air temperature of 200°F for 104 hours, plus 212°F for 70 additional hours and shall evidence no damage or deterioration.

3.4.6 Durability.

3.4.6.1 Passenger cars. Arms, blades and wiping elements and blade refills for use in passenger cars shall meet the durability requirements of SAE J903.

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3.4.6.2 Trucks and other vehicles. Arms, blades and wiping elements for installation on trucks and other vehicles shall remain functional throughout 100 hours of continuous operation as specified in 4.6.8.2.1. At the conclusion of this period, the blade shall be examined for wear, blade straightness, cracks, open pores, feather edges, or any other defects which might affect performance.

3.5 Finish.

3.5.1 Federal agency vehicles. Visible metal surfaces of windshield wiper arms and blades supplied on Federal agency vehicles shall comply with the specular gloss requirements of Federal Motor Vehicle Safety Standard (FMVSS) 107.

3.5.2 Military vehicles. All ferrous metal components of the arm and blade shall be treated with a phosphate coating conforming to type I or type II of TT-C-490. Finish shall be as specified in MIL-E-52798 (air dry) or MIL-E-52835 (baked-lusterless). Color shall be forest green. At the option of the contractor, finish shall consist of preparing the metal in accordance with the applicable requirements of MIL-STD-193, a coat of primer conforming to TT-P-636, and a finish coat as previously specified. The specular gloss requirements of 3.5.1 shall apply.

3.5.3 Optional finish. When specified (see 6.2), all visible surfaces of windshield wiper arms and blades supplied on military vehicles shall be black dichromate finish or equivalent in accordance with the latest state of the art or best commercial practice.

3.6 Marking. Windshield wiper arms, blades, and blade refills shall be permanently and legibly marked with the manufacturer's name or trademark and part number in accordance with MIL-STD-130.

3.7 Workmanship. Workmanship shall be of such quality as to assure that windshield wiper system and its components are free of defects that compromise, limit or reduce the capability of the windshield wiper system in the performance of its intended use. In addition to general appearance, the defects listed in table II shall be considered cause for failure.

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 specified herein. Except as otherwise specified in the contract or 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 that supplies and services conform to prescribed requirements.

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4.1.1 Contractor's quality assurance system. Unless otherwise specified by the procuring activity, the contractor shall provide and maintain an effective inspection and quality assurance system, acceptable to the Government, covering the supplies under the contract. A current written description of the system shall be submitted to the contracting officer prior to initiation of production. The contractor will not be restricted to the inspection listed, provided that an equivalent control is included in the approved quality assurance procedure. The contractor shall notify the Government of, and obtain approval for, any change to the submitted procedure that might affect the degree of control required by this specification, or other applicable documents referenced herein.

4.1.2 Government verification. All quality assurance operations performed by the contractor will be subject to Government verification at unscheduled intervals. Verification will consist of surveillance of the operations to determine the practices, methods, and procedures of the written inspection plan are being properly applied, and Government product inspection to measure quality of product offered for acceptance. Deviation from prescribed or agreed-upon procedures, or instances of poor practices which might have an adverse effect upon the quality of the product, will immediately be called to the attention of the contractor. Failure of the contractor to promptly correct deficiencies shall be cause for suspension of acceptance until corrective action has been made, or until conformance of product to prescribed criteria has been demonstrated.

4.1.3 Materials. The contractor's inspection records shall be examined to determine contractor conformance to 3.2.

4.2 Classification of inspections. Classification of inspections shall be as follows:

a. First article inspection (see 4.4).
b. Quality conformance inspection (see 4.5).

4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified herein.

TABLE I. Test schedule.

| Description | Requirement | Test application Arms | Test application blades/refills | First article | Acceptance test | Control test |
|---|---|---|---|---|---|---|
| Ozone resistance | 3.2.1 | | X | 4.6.1 | | |
| Chemical resistance | 3.2.2 | | X | 4.6.2 | | |
| Wiped area | 3.4.1 | X | X | 4.6.3 | | |
| Wiper blade pressure | 3.4.2 | | X | 4..6.4 | 4.6.4 | 4.6.4 |
| Wiper arm resistance to push and pull | 3.4.3 | X | | 4.6.5 | 4.6.5 | 4.6.5 |
| Wiping element retention | 3.4.4 | | X | 4.6.6 | | |
| Temperature resistance | 3.4.5 | X | X | 4.6.7 | | 4.6.7 |
| Durability | 3.4.6 | X | X | 4.6.8 | | |
| Packaging | Section 5 | X | X | 4.6.9 | | |

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4.4 First article inspection. First article inspection shall be performed after award of contract and prior to production (see 3.1). Inspection shall be performed on sample units which have been produced with equipment and procedures normally used in production. First article approval is valid only on the contract under which it is granted, unless extended by the Government to other contracts.

4.4.1 Sample size. Unless otherwise specified (see 6.2), 12 of each type, class and style of item to be produced shall be submitted for first article inspection.

4.4.2 Inspection routine. Samples shall be examined for defects listed in table II and tested as specified in table I.

4.4.3 Failure. One or more failures shall be cause for refusal to grant first article approval and refusal by the Government to conduct additional inspections until satisfactory corrective measures have been taken by the contractor.

4.5 Quality conformance inspection.

4.5.1 Inspection provisions.

4.5.1.1 Lot size. Unless otherwise specified (see 6.2), a lot shall consist of all arms, blades, or refills of one type, class and style from an identifiable production period, from one manufacturer, submitted at one time for acceptance.

4.5.1.2 Sampling for examination. For the purpose of visual, dimensional, and primary functional inspection, a representative sample shall be selected from each lot in accordance with MIL-STD-105.

4.5.1.3 Sampling for acceptance testing. Samples for acceptance testing shall be selected in accordance with inspection level S-3 of MIL-STD-105.

4.5.2 Quality conformance examination.

4.5.2.1 Acceptable quality levels (AQL). Each wiper arm, blade, or blade refill, as applicable, selected in accordance with 4.5.1.2 shall be examined for conformance to the following acceptable quality levels (AQL's) on the basis of percent defective:

| Classification | AQL |
|---|---|
| Major | 1.0 |
| Minor | 2.5 |

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4.5.2.2 Classification of defects. For examination purposes, defects shall be classified in accordance with table II.

TABLE II. Classification of defects.

| Category | Defects | Method of inspection |
|---|---|---|
| Major | | |
| 101 | Materials not as specified (see 3.2) | Visual |
| 102 | Dimensions affecting interchangeability not within tolerance (see 3.3) | Visual |
| 103 | Blade hook or adapter missing (see 3.3.3) | Visual |
| 104 | Wiper arm adjustment or attachment defective (see 3.3.3) | Visual |
| 105 | Finish not as specified (see 3.5) | Visual |
| Minor | | |
| 201 | Dimensions not affecting interchangeability not within tolerance (see 3.3) | Visual<br>SIE 1/ |
| 202 | Missing or improper marking (see 3.6) | Visual |
| 203 | Faulty workmanship (see 3.7) | Visual |

1/ Standard inspection equipment.

4.5.2.3 Rejected lots. If an inspected lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units and resubmit for reinspection. Resubmitted lots shall be reinspected using tightened inspections. Such lots shall be separate from new lots, and shall be clearly identified as resinspected lots.

4.5.3 Classification of tests. Tests shall be classified as follows:

a. Acceptance test (see 4.5.4).
b. Control tests (see 4.5.5).

4.5.4 Acceptance test. Samples selected in accordance with 4.5.1.3 shall be subjected to test specified in table I, using an AQL of 6.5 on the basis of percent defective.

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4.5.4.1 Test failure. The failure of any item to pass the acceptance test specified, may be cause for the Government to stop acceptance of subsequent items until evidence has been provided by the contractor that corrective action has been accomplished.

4.5.5 Control test.

4.5.5.1 Sampling. Control test samples of arms, blades or blade refills shall be selected at a rate of 4 per month or 4 of each 400 units produced on a contract. No more than 8, nor less than 4, shall be selected in any 30 day period.

4.5.5.2 Test routine. Each control test specimen shall be examined for defects specified in 4.5.2.2 and subjected to tests specified in table I.

4.5.5.3 Failure. Failure of a control test sample to pass any specified examination or test may be cause for the Government to refuse to accept subsequent lots until it has been proved to the satisfaction of the Government that the defects revealed by the test have been corrected.

4.6 Conformance verification.

4.6.1 Ozone resistance test. To determine conformance to 3.2.1, rubber components of wiper blades shall be subjected to the ozone resistance test specified in SAE J903 or SAE J198, except that exposure time for military items shall be 168 hours.

4.6.2 Chemical resistance test. To determine conformance to 3.2.2, wiper blades shall be subjected to the applicable test specified in SAE J903 or SAE J198.

4.6.3 Wiped area test.

4.6.3.1 Passenger cars. To determine conformance to 3.4.1.1, the item supplied shall be installed in a passenger car windshield wiping system and tested in accordance with SAE J903.

4.6.3.2 Trucks and other vehicles.

4.6.3.2.1 Test apparatus. Test apparatus shall include a supply of distilled water, a supply of dust conforming to MIL-D-13570, a windshield glass and frame of the kind required in the intended application, a windshield wiper motor, and a means for causing the motor to function and move the wiper blade back and forth across the glass in the intended pattern for normal operation. The cleaning arc shall be not less than 120° (see figure 1).

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4.6.3.2.2 Test procedure. To determine conformance to 3.4.1.2, the wiper arm and blade shall be installed in the manner of the intended application, examined to assure proper contact of the wiper blade with the glass, and set in motion back and forth across the glass for not less than 10 cycles of operation. Following this period of operation, the glass shall be wiped clean on both faces and the outer face shall be coated with a solution composed of distilled water and dust concentration of not less than 25 grams of dust per 45 milliliters of water. While the solution on the glass is wet, the wiper blade shall be actuated to wipe the glass one stroke in one direction and a record made of the pattern made by the wiper in the paste on the glass. Immediately after recording this pattern, the glass and wiper shall be cleaned. The glass shall again be coated with the water and dust solution, as before, and one complete wipe made by the blade in the direction opposite to the previous wipe. The pattern made on the glass shall be recorded as before. The glass and wiper blade shall again be cleaned and the test repeated for 5 consecutive cycles (10 strokes) of the wiper blade. The cleaning pattern shall be compared with figure 1 and then photographed to determine conformance to 3.4.1.2.

4.6.4 Blade pressure test.

4.6.4.1 Test apparatus. Apparatus for conducting the test shall include means for installing the wiper blade and arm in a manner simulating the intended application and a suitable scale for weighing the pressure of the wiper blade against the glass. All tests shall be made at median position of the blade.

4.6.4.2 Test procedure. To determine conformance to 3.4.2, with the windshield wiper installed as specified in 4.6.4.1 and the wiper blade in full contact with the glass, the pressure of the blade against the glass shall be weighed by means of a scale.

4.6.5 Push or pull resistance test. To determine conformance to 3.4.3, with arm and blade installed as specified in 4.6.4.1, a pressure of 2 pounds shall be exerted, first to the right and then to the left, upon the 1-inch length of wiper arm farthest removed from the shaft of the driving mechanism.

4.6.6 Wiping element retention test.

4.6.6.1 Style 1. To determine conformance to 3.4.4, one end of the metal frame of the blade assembly shall be removed sufficiently to allow a clamp with a measuring scale to be attached to the wiping element. The other end of the metal frame shall be so held that there will be no added pressure against the wiping element. A pull of 15 pounds shall be made on the bared end of the wiping element, in the major plane of the blade and at right angles to that plane.

4.6.6.2 Style 2. To determine conformance to 3.4.4, the length of the rubber wiping element shall be secured in a suitable clamping device. A measuring scale shall be attached to the wiper arm attachment case of the blade assembly. A pull of 15 pounds shall be applied to the blade assembly, in the major plane of the blade and at right angles to that plane.

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4.6.7 Temperature resistance test. To determine conformance, to 3.4.5, Federal agency arms, blades and refills shall be tested as specified in SAE J903. Military arms, blades and refills shall be tested as follows:

4.6.7.1 Low temperature brittleness test. Wiper blades and refills shall be tested as specified in method 5311 of Fed. Test Method Std. No. 601, using the air heat-transfer medium, to determine conformance to 3.4.5.1.

4.6.7.2 High temperature test. To determine conformance to 3.4.5.2, wiper blades and refills shall be subjected to an ambient air temperature of 200° + 3°F for 104 hours and then to a temperature of 212° ± 3°F for 70 hours (a total of 174 continuous hours). Test chamber shall be as specified in method 7221 of Fed. Test Method Std. No. 601.

4.6.8 Durability test.

4.6.8.1 Passenger cars. To determine conformance to 3.4.6.1, Federal agency arms, blades and blade refills shall be tested as specified in SAE J903.

4.6.8.2 Trucks and other vehicles. To determine conformance to 3.4.6.2, military arms, blades and blade refills shall be tested as specified in 4.6.8.2.1.

4.6.8.2.1 Abrasion procedure - blades and blade refills. After installing a new blade or blade refill, the arm and blade assembly shall be operated for 100 hours as follows: Operation shall be on a 24-hour basis at 40 cycles per minute (cpm). During the 8-hour working period, a dust solution consisting of not less than 25 grams of dust, conforming to MIL-D-13570, per 45 milliliters of water shall be applied to the glass hourly. During the 16 hour night period the blade shall operate on dry glass. At the end of 100 hours of continuous operation, the blade shall be examined to determine conformance to specified requirements.

4.6.9 Examination of preparation for delivery. An examination shall be made to determine conformance to the requirements of section 5. The sample unit shall be one shipping container fully prepared for delivery. Sampling shall be in accordance with MIL-STD-105. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of percent defective.

## 5. PREPARATION FOR DELIVERY

### 5.1 Civil agencies.

5.1.1 Packaging. Packaging shall be level A or commercial, as specifed (see 6.2).

5.1.1.1 Level A. Each blade or arm shall be packaged in a close-fitting paperboard or fiberboard box or a plastic tube with ends. The packages shall be secured to prevent accidental opening during shipment, handling and storage.

5.1.1.2 Commercial. The blades or arms shall be packaged in accordance with normal commercial practice. The complete package shall be designed to protect the blades or arms against damage during shipment, handling and storage.

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5.1.2 Packing. Packing shall be level A or commercial, as specified (see 6.2).

5.1.2.1 Level A. Blades or arms of like description, packaged as specified in 5.1.1.1, shall be packed in quantities as specified in the contract or order in a close-fitting box conforming to PPP-B-636, class weather resistant, style optional. Closure and waterproof sealing of the boxes shall be in accordance with the appendix to PPP-B-636. Alternatively, cleated plywood, wire bound or nailed wood boxes shall be acceptable shipping containers when lined with a waterproof barrier material. The edges of the barrier material shall be sealed with waterproof tape or adhesive.

5.1.2.2 Commercial. Blades or arms of like description, packaged as specified in 5.1.1.2, shall be packaged in a fiberboard box to insure delivery at destination, provide for redistribution by the initial receiving activity, and be acceptable by common carrier under National Motor Freight Classification and Uniform Freight Classification.

5.1.3 Marking. Shipping containers shall be marked as specified in the contract or order.

5.2 Military agencies.

5.2.1 Packaging requirements. The requirements for packaging shall be in accordance with the applicable packaging standard or packaging data sheet for the desired level of protection specified in the contract or order issued by the procuring activity (see 6.2). Commercial packaging, packing and marking, when specified, shall be in accordance with MIL-STD-1188.

6. NOTES

6.1 Intended use. Windshield wiper arms and blades covered by this specification are intended for use on civil and military vehicles for cleaning the windshield to aid visibility in all types of climatic conditions.

6.2 Ordering data. Purchasers should select the preferred options herein and include the following information in the purchase document:

a. Title, number, and date of this specification.
b. Type, class, and style required (see 1.2).
c. First article, if required (see 3.1).
d. Detail drawing or MS sheet form standard, as applicable (see 3.3).
e. Length of wiper blades and wiper arms, as applicable (see 3.3.3 and 3.3.4).
f. If adapters are to be other than specified (see 3.3.3.2).
g. When optional finish is required (see 3.4.3).
h. If lot is to be other than specified (see 4.5.1.1).
i. Selection of applicable level of packaging and packing (see 5.1.1 and 5.1.2).
j. Selection of applicable packaging requirements (see 5.2.1).
k. Quantity of unit packages required in shipping container (see 5.1.2.1).

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6.3 First article. When a first article is required, it shall be tested and approved under the appropriate provisions of 7-104.55 of the Armed Services Procurement Regulation. The contracting officer should include specific instructions in all procurement instruments regarding arrangements for examination, tests and approval of the first article (see 3.1).

6.4 Recycled materials. The use of recycled materials which meet the requirements of the applicable material specifications without jeopardizing the intended use of the item shall be encouraged.

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