



AEROSPACE STANDARD

AS6224™

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Reaffirmed	2020-08

Wrap-Around Insulation Repair and Protection Sleeve,
Permanent, Electric, Environment Resistant

FSC 5940

RATIONALE

Specification needed to provide a repair sleeve for mechanical and electrical protection of damage wire insulation or cable jacket in installed aircraft.

1. SCOPE

The AS6224 specification covers environment resistant, permanent insulation repair sleeves for repairing different types of insulation damages of wire or cable jackets in installed applications. The repair sleeve is intended to repair damaged primary wire or cable jacket covers where the shielding and wire conductors are not damaged.

1.1 Type I

Contains an insulation sleeve (outer sleeve) and a piece of adhesive (inner sleeve) that are manufactured in discrete lengths designed to clip over the damaged area and heated to recover and seal.

1.2 Type II

Contains an insulation sleeve (outer sleeve) and adhesive (inner sleeve) that are laminated together and designed to wrap around the damaged area and heated to recover and seal.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and 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.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS1424 Deicing/Anti-Icing Fluid, Aircraft, SAE Type I

AMS-DTL-23053 Insulation Sleeving, Electrical, Heat Shrinkable, General Specification For

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SAE WEB ADDRESS:

For more information on this standard, visit
<https://www.sae.org/standards/content/AS6224>

*AS6224/1	Repair Sleeve, Primary Wire Insulation Damage, Electric, Permanent, Environment Resistant, Type I, 150 °C Max
AS7928	Terminals, Lug: Splices, Conductor: Crimp Style, Copper, General Specification For
AS22759	Wire, Electrical, Fluoropolymer-Insulated, Copper or Copper Alloy
AS22759/11	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Silver-Coated Copper Conductor, 600 Volt
AS22759/12	Wire, Electrical, Fluoropolymer-Insulated, Extruded TFE, Nickel-Coated Copper Conductor, 600 Volt
AS50861	Wire, Electric, Polyvinyl Chloride Insulated, Copper or Copper Alloy
AS81044	Wire, Electrical, Crosslinked Polyalkene, Crosslinked Alkane-Imide Polymer, or Polyarylene Insulated, Copper or Copper Alloy

*AS6224 detail specification

2.1.2 ASQ Publications

Available from American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, Tel: 800-248-1946 (United States or Canada)), 001-800-514-1564 (Mexico) or +1-414-272-8575 (all other locations), www.asq.org.

ANSI/ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes

2.1.3 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D1974/D1974M Fiberboard Boxes, Methods of Closing, Sealing, and Reinforcing, Standard Practice for

ASTM D5118/D 5118M Standard Practice for Fabrication of Fiberboard Shipping Boxes

ASTM D5486/D5486M Standard Specification for Pressure-Sensitive Tape For Packaging, Box Closure, And Sealing

2.1.4 National Conference of Standards Laboratories (NCSL) Publications

Available from NCSL International, 2995 Wilderness Place, Suite 107, Boulder, CO 80301, Tel: 303-440-3339, www.ncsli.org.

NCSL Z540.3 Calibration of Measuring and Test Equipment, Requirements for

2.1.5 U. S. Government Publications

Copies of these documents are available online at <http://quicksearch.dla.mil>.

SD-6 Provisions Governing Qualification

MIL-STD-129 Military Marking for Shipment and Storage

MIL-STD-202 Test Methods for Electronic and Electrical Component Parts

P-D-410 Dishwashing Compound, Hand (Synthetic Detergent, Solid and Liquid Form)

PPP-B-566 Boxes, Folding, Paperboard

MIL-STD-2073-1	Military Packaging, Standard Practice for
A-A-3174	Plastic Sheet, Polyolefin
MIL-PRF-5606	Hydraulic Fluid, Petroleum Base, Aircraft, Missile and Ordnance
MIL-DTL-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-PRF-7808	Lubricating Oil, Aircraft Turbine Engine Synthetic Base
MIL-PRF-22191	Barrier Materials, Transparent, Flexible, Heat-Sealable
MIL-PRF-23699	Lubricating Oil, Aircraft Turbine Engines, Synthetic Base, NATO Code Number 0-156
MIL-DTL-81381	Wire, Electric, Polyimide-Insulated, Copper or Copper Alloy
MIL-DTL-83133	Turbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34) and JP-8+100 (NATO F-37)
MIL-PRF-87937	Cleaning Compound, Aerospace Equipment

2.2 Definitions

2.2.1 CRITICAL DEFECTS

A critical defect is a defect that judgment and experience indicate would result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product, or a defect that judgment and experience indicate is likely to prevent performance of the actual function of a major end item such as a ship, aircraft, tank, missile, or space vehicle.

2.2.2 DEFECT

A defect is any nonconformance of the unit of product with specified requirements.

2.2.3 MAJOR DEFECT

A major defect is a defect, other than critical, that is likely to result in failure, or to reduce the usability of the unit of product for its intended purpose.

2.2.4 MINOR DEFECT

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.

3. REQUIREMENTS

3.1 Detail Specification

The product requirements shall be as specified herein and in accordance with the applicable detail specification. In the event of any conflict between the requirements of this specification and the detail specification, the latter shall govern.

3.2 Qualification

A qualified component shall be a product that has been tested and has passed the qualification tests specified herein, and has been listed on or approved for listing on the applicable Qualified Products List (see Section 4 and 6.3).

3.3 Materials

The materials used shall be specified in detailed specification.

3.4 Design and Construction

Design and construction shall be specified in detailed specification.

3.4.1 Wire Acceptance

Each size of repair device shall be designed to accommodate wire sizes as specified in the detailed specification.

3.4.2 Sleeve and Adhesive Length

3.4.2.1 Type I

The pre-cut length of the sleeve and adhesive shall be specified in the detail specification sheet. The sleeve and adhesive shall not be cut by the users of the repair sleeve, unless otherwise instructed by the manufacturer.

3.4.2.2 Type II

The laminated insulation repair sleeve shall be cut to length during installation in accordance with the process specified in the detailed specification.

3.5 Performance

The device shall conform to the following requirements:

3.5.1 Insulation Sleeve and Adhesive Materials

3.5.1.1 Dimensions (see 4.7.1)

The sealing sleeve component of the device assembly shall conform to the dimensions of the applicable detail specification.

3.5.1.2 Fungus Resistance (see 4.8.7)

Unless otherwise specified in detail specification, the outer shell and inner adhesive shall be fungus resistant in accordance with AMS-DTL-23053.

3.5.2 The Repaired Wire Assembly

The repaired wire assembly shall conform to the following requirements when the damaged insulation is repaired with the device with the applicable tooling specified (see 3.4).

3.5.2.1 Insulation Resistance

When tested in accordance with 4.8.1, installed assembly shall have the minimum value of 5000 MΩ.

3.5.2.2 Dielectric Withstanding Voltage

When tested in accordance with 4.8.2, the device shall show no evidence of damage, arcing, or breakdown and the leakage current shall be less than 2 mA.

3.5.2.3 Slip Resistance Strength

When tested in accordance with 4.8.3, the slip resistance strength shall be as defined in the detailed specification.

3.5.2.4 Environmental Conditioning

Device assemblies shall meet the applicable performance requirements listed in Tables 1 and 2, when tested in accordance with test methods listed in Tables 1 and 2. Discoloration of the sealing sleeve materials during these tests shall not be cause for rejection (see 4.8.4).

3.5.2.5 Flammability (see 4.8.5)

The assembled device shall be self-extinguishing within 5 seconds after removal of the external flame source from the device assembly.

3.5.2.6 Blocking (see 4.8.6)

The outer shell of the individual sleeves in the test bundle shall not stick together (see 4.8.6). The exposed adhesive may stick and shall not be a cause for a reject.

3.6 Identification of Product (see 4.7.1)

The device shall be color coded in accordance with the applicable detail specification for identification purposes. Color coding shall be readily discernible before/after the installation.

3.7 Workmanship (see 4.7.1)

The repair sleeve when installed shall be free of gross defects such as for example, blisters, cuts, holes, etc.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

Unless otherwise specified herein, in the contract or in the purchase order, the supplier is responsible for the performance of all contract inspection requirements. Except as otherwise specified herein, in the contract or in the purchase order, the supplier may use any facilities suitable for the performance of the inspection requirements. The Qualifying Activity has the right to perform any of the inspections set forth in the standard where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.1.1 Responsibility for Compliance

All items must meet all technical requirements of this standard and the applicable detail specification. The inspections set forth in this standard shall become a part of the supplier's overall inspection system or quality program. The absence of any general or specific inspection requirements in the standard shall not relieve the supplier of the responsibility of assuring that all products comply with all requirements of the contract or purchase order. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the purchaser to acceptance of defective material.

4.1.2 Inspection Equipment and Facilities

Test and measuring equipment, and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspections shall be established and maintained by the supplier. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with NCSL Z540.3 or equivalent standards.

4.2 Classification of Inspection

The examination and testing of sleeves shall be classified as follows:

- a. Component-materials inspection (see 4.3).
- b. Qualification inspection (see 4.5).
- c. Quality conformance inspection (see 4.6).

4.3 Component-Materials Inspection

Component-materials inspection shall consist of verification that the component materials as specified in the detailed specification. Component materials used in fabricating the sleeves and adhesive are in accordance with this standard and applicable detail specification prior to such fabrication.

4.4 Inspection Conditions

Unless otherwise specified herein, all inspections shall be made at ambient temperature, and humidity as specified in the general requirements of MIL-STD-202.

4.4.1 Sample Preparation, Test Specimen Assembly (Qualification Specimens)

Unless otherwise specified in the detail specification, the sleeve/adhesive specimens shall be assembled to an insulated wire, see detailed specification, with damaged insulation (simulated) by the testing activity using an appropriate heat source (see 3.4). The wire shall conform to AS22759/11 or AS22759/12. The simulated damage shall be created by scraping the insulation with a knife or removing part of the insulation by cutting the insulation 360 degrees radially and removing part of the insulation to expose the conductor or shield. The length of the exposed conductor or shield shall be defined in the detail specification. The specified number of sample units for testing shall be selected and divided between the minimum and the maximum wire and/or cable size within the wire range listed on the applicable detail specification for the size splice to be qualified. These sizes will qualify all sizes specified for the splice by similarity (see 4.5.3). Detailed specification shall specify based on the intended use of the product the test wire or cable as required.

4.4.2 Temperature Stabilization

Voltage drop measurements shall be made after the temperature of the wire has stabilized. Temperature stabilization shall be determined by three consecutive readings within ± 1 °C at intervals of 3 minutes each. All tests performed after exposure to high or low temperature shall be conducted after sleeves have been conditioned for at least 1 hour at the inspection conditions specified (see 4.4).

4.4.3 Water Bath

Unless otherwise specified in the applicable test method, a water bath containing 0.5% of an anionic wetting agent (P-D-410) and 5.0% sodium chloride shall be used whenever immersion is specified. Free ends of leads shall be a minimum of 4 inches from the top surface of water.

4.5 Qualification Inspection

Initial qualification inspection shall be in accordance with Table 1. Sequential testing is required for each group unless otherwise specified in the table. The qualifying activity shall perform or witness the particular tests as specified in Table 1 (see Groups I and III) and the supplier shall perform the remaining tests. All test laboratories require qualifying activity approval.

4.5.1 Initial Qualification Inspection Procedure

A request for qualification shall be made to the qualifying activity (see 6.3) prior to initiating testing. Testing cannot begin until the supplier has received an authorization letter. The supplier is recommended to provide the qualifying activity a test plan based on the authorization letter to ensure the supplier and qualifying activity maintain communication and document changes as needed. The qualifying activity shall not approve a component that does not meet the requirements specified herein. The qualifying activity has the authority to impose specific specification test requirements to resolve test failures/discrepancies and to waive testing to verify specific product manufacturing changes or qualifications by similarity. Any change in the supplier's process control inspections, quality conformance inspections, or manufacturing control drawings (editorial changes are acceptable) without the express approval of the qualifying activity may result in loss of qualification for that product.

4.5.2 Initial Qualification Samples

For each component tested the supplier shall use the same materials, manufacturing procedures, and methods of inspection as would be used to provide the component to a purchaser. Sleeves shall be assembled as specified in 4.4.1 for testing. All sleeves sizes (dash number) in each detail specification (see 3.1) for which qualification is sought shall be submitted for qualification testing except as noted for qualification by similarity (see 4.5.3).

- a. For the qualifying activity tests, 20 unwired specimens (14 for testing and 6 spares) for each part number shall be separately packaged and forwarded to the address designated in the letter of authorization (see 6.3). Sufficient wire and/or cable shall be provided to perform the designated tests. Each sample shall be identified by marking each package with the following information:

Sample for qualification

Specification AS6224

Part number _____

INSULATION REPAIR SLEEVE, PERMANENT, ELECTRIC ENVIRONMENT RESISTANT

Name of supplier

Supplier's part number

Submitted (date) under authorization (reference letter authorizing the inspection)

- b. For the supplier tests, 16 specimens shall be tested in accordance with Table 1 for each part number.

4.5.3 Initial Qualification by Similarity

The qualifying activity and the supplier may agree on other similarity test samples (see 4.5.1) and sequences not specified herein provided the products and test requirements associated with the agreed upon similarity are specified herein. In all cases, Group I shall be performed on all sizes. The qualifying activity may accept data generated under oversight of a user activity, provided the requirements used to generate the data are equal to or greater than the requirements specified herein.

4.5.4 Initial Qualification Test Report

The qualifying activity shall provide the supplier with a data package of results for all tests performed in accordance with Table 1. The qualifying activity test methods and procedures shall be made available to the supplier upon request. The supplier shall provide a test report to the qualifying activity for the tests specified in Table 1. The test report shall be signed by the manufacturing authority responsible for ensuring compliance to the specification requirements. The supplier may combine the qualifying activity test data with the supplier's test data for one final qualification test report. The final test report and/or data package shall remain on file with the supplier for a minimum period of 6 years and be available to the qualifying activity upon request. The supplier qualification test report shall contain as a minimum the following information.

- a. The quantitative results for tests specified in Table 1 and the authorization letter.
- b. For components qualified by similarity, a tabulated comparison between the dimensions specified herein and each manufacturer's controlled drawings.
- c. Corrective Action Reports (as applicable)

Table 1 - Initial qualification inspection

Examination or Test	Requirement Paragraph	Test Method Paragraph
Group I (10 uninstalled sleeves and adhesives) <u>1/</u> <u>2/</u>		
Material certification	3.3.1, 3.3.2	4.3
Visual and dimensional examination	3.4	4.7.1
Identification of product	3.6	4.7.1
Workmanship	3.7	4.7.1
Group II (1 uninstalled sealing sleeve and adhesives)		
Fungus Resistance	3.5.1.2	4.8.7
Group III (4 installed assemblies) <u>2/</u>		
Environmental conditioning	3.5.2.4	4.8.4
Altitude immersion (3 cycles)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Immersion	--	4.8.4.2
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Temperature cycling	--	4.8.4.3
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Moisture resistance	--	4.8.4.4
Vibration <u>3/</u>	--	4.8.4.6
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Heat aging	--	4.8.4.7
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Dielectric withstanding voltage	3.5.2.2	4.8.2
Slip Resistance Strength	3.5.2.3	4.8.3
Group IV (2 installed assemblies)		
Flammability	3.5.2.5	4.8.5
Group V (6 installed assemblies)		
Fluid immersion	--	4.8.4.5
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Dielectric withstanding voltage	3.5.2.2	4.8.2
Group VI (7 installed assemblies)		
Blocking	3.5.2.6	4.8.6

1/ Group sequence not required2/ Qualifying Activity test groups3/ Initial qualification only

4.5.5 Failures

Any failure of a specific type device shall be cause for refusal to grant qualification to that part number and all part numbers submitted by similarity to that part number.

4.5.6 Retention of Qualification

Retention of qualification inspection shall occur every 36 months after the initial qualification date. The Qualifying Activity may shift the reporting date to accommodate testing schedules, but no later than 18 months from the retention of qualification due date.

- a. No Production Certification: If no production of the qualified products has occurred for the entire reporting period, the Supplier may provide a certification to the Qualifying Activity that no changes in the product materials, design, manufacturing processes, or site of production have occurred since the initial Qualification Inspection (see 4.5). Certification for more than one reporting period shall not be permitted. The Supplier shall contact the Qualifying Activity to determine the conditions of the Certification. The Supplier may be required to submit the Certification on a specified form provided by the Qualifying Activity.
- b. Component Production: If a qualified component has been produced in the retention period, the component or a component from that family qualified by similarity shall be submitted (see 4.5.3). Retention of Qualification consists of the tests specified in Table 2 and shall be performed or witnessed by the Qualifying Activity.

4.5.7 Retention of Qualification Test Samples

Retention of qualification test sample shall be the same as the initial qualification samples (4.5.2a). Actual parts to be tested as described in Table 2 shall be selected by the Qualifying Activity from the parts submitted.

4.5.8 Retention of Qualification Test Report

The qualifying activity shall provide the supplier a data package of all tests results performed in accordance with Table 2. The qualifying activity test method procedures shall be made available to the supplier upon request. The supplier shall provide a test report to the qualifying activity for the tests specified in Group A and B (see 4.6, Table 3, and Table 4). The test report shall be signed by the manufacturing authority responsible for ensuring compliance to the specification requirements. The supplier may combine the qualifying activity test data with the supplier's test data into one final qualification test report. The final test report and/or data package shall remain on file with the supplier for a minimum period of six (6) years and be available to the qualifying activity upon request.

The supplier test report shall contain as a minimum the following information.

- a. A summary of quantitative pass or fail results for tests specified in Group A and B, and the authorization letter.
- b. Corrective Action Reports (as applicable).

4.5.9 Retention of Qualification Failures

Any failure of a specific type device shall be cause for refusal to grant qualification to that part number and all part numbers previously approved by similarity to that part number.

Table 2 - Retention of qualification requirement

Examination or Test	Requirement Paragraph	Test Method Paragraph
Group I (10 uninstalled sleeves)		
Material certifications	3.3.1, 3.3.2	4.3
Visual and dimensional examination	3.4	4.7.1
Identification of Product	3.6	4.7.1
Workmanship	3.7	4.7.1
Group III (4 installed assemblies)		
Environmental conditioning	3.5.2.4	4.8.4
Altitude immersion (3 cycles)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Immersion	--	4.8.4.2
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Temperature cycling	--	4.8.4.3
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Moisture resistance	--	4.8.4.4
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Heat aging	--	4.8.4.7
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Dielectric withstanding voltage	3.5.2.2	4.8.2
Slip Resistance Test	3.5.2.3	4.8.3

4.6 Quality Conformance Inspection

4.6.1 Inspection of Product for Delivery

Inspection of product for delivery shall consist of Group A inspection (see 4.6.2). Except as specified in 4.6.3.2, delivery of products which have passed Group A inspection shall not be delayed pending the results of Groups B inspection (see Table 6).

4.6.1.1 Inspection Lot

An inspection lot, as far as practicable, shall consist of all sleeves of a single size and composition; manufactured under essentially the same conditions and offered for inspection at one time.

4.6.2 Group A Inspection

Group A inspection shall consist of the examination and test specified in Table 3 and shall be made on the same set of sample units, in the order shown. After the visual examination, the lot shall be divided and slip resistance tests performed as specified in 4.8.3.

4.6.2.1 Sampling Plan

The procedure for continuous production sampling is to select a sampling plan from ANSI/ASQ Z1.4 for normal inspection, based on the specified Acceptance Quality Level (AQL) shown in Table 3. Major and minor defects shall be as defined herein (see 2.2.3, 2.2.4, and Table 3). A manufacturer's normal quality control tests and production tests may be used to fulfill Group A inspection, provided they at least equal the quality required by Table 3.

4.6.2.2 Rejected Lots

If an inspection lot is rejected, the supplier shall withdraw the lot and may then rework it to correct the defects or screen out the defective units. Such lots shall be kept separate from new lots and shall be re-inspected. Such lots shall be re-inspected using tightened inspection.

Table 3 - Group A inspection

Examination or Test	Requirement Paragraph	Method Paragraph	AQL		Sampling Plan
			Major	Minor	
Material certifications <u>1/</u>	3.3.1, 3.3.2	4.3	N/A	N/A	N/A
Visual and dimensional examination	3.4	4.7.1	c=0	c=0	S-4
Identification of Product	3.6		r=1	r=1	
Workmanship	3.7				
Slip Resistance Test	3.5.2.3	4.8.3	c=0	c=0	S-1
			r=1	r=1	

1/ Confirmation of certifications required.

4.6.3 Group B Inspection

Group B inspection: Group B inspection shall consist of the tests specified in Table 4 Group B. Inspections shall be made on sleeves selected from inspection lots which have passed Group A inspection

Table 4 - Group B inspection

Test	Requirement Paragraph	Method Paragraph
Altitude immersion (1 cycle)	--	4.8.4.1
Insulation resistance	3.5.2.1	4.8.1
Dielectric withstanding voltage	3.5.2.2	4.8.2

4.6.3.1 Sampling Plan

Twelve (12) months after the date of notification of qualification, and after each subsequent 12 month period, 15 sleeves shall be selected from those covered by a single detail specification and having the same size. A manufacturer's normal quality control tests and production tests may be used to fulfill all or part of Group B inspection; however, all of the Group B inspection shall be completed as specified.

4.6.3.2 Failures

If one or more units fail to pass Group B inspection, the sample shall be considered to have failed. The supplier shall take corrective action on the materials or processes, or both, as warranted and on all units of product which are considered subject to the same failure. Acceptance of the product shall be discontinued until corrective action has been taken. After the corrective action has been taken, Group B and/or Group A (see Table 3) inspection, as applicable, shall be repeated on additional units. Final acceptance shall be withheld until the Group B re-inspection, as applicable, has shown that the corrective action was successful. The corrective action shall be submitted to the qualifying activity as part of the retention of qualification (see 4.5.8b).

4.6.3.3 Disposition of Samples

Samples which have been subjected to Group B inspection shall not be delivered on the contract or order.

4.6.4 Inspection of Preparation for Delivery

The sampling and inspection of the preservation-packaging and interior package marking shall be in accordance with the groups A and B quality conformance inspection requirements and MIL-STD-2073-1. The sampling and inspection of the packing and marking for shipment and storage shall be in accordance with the quality assurance provisions of the applicable container specification and the marking requirements of MIL-STD-129.

4.7 Examinations

4.7.1 Visual and Dimensional Examination (see 3.4)

Sleeves shall be examined to verify that the materials, design, construction, identification of product, workmanship, and physical dimensions are in accordance with this specification and the applicable detail specification. Classification of defects for visual and dimensional examination shall be as specified in Table 5. No major or minor or defects are permitted for qualification testing.

Table 5 - Classification of defects

Examination of Product	Major	Minor
Dimensions		
Overall length of outer shell	X	
Overall length of inner adhesive sealant	X	
All other dimensions	X	
Materials	X	
Workmanship		X
Missing components	X	
All other criteria		X

4.7.1.1 Visual Examination and Dimensions

- Dimensions (as specified in the detail specification): Dimensions shall be measured with calibrated micrometers using standard laboratory methodology.
- Outer shell thickness and adhesive (when specified): The thickness of outer shell and adhesive shall be measured separately. The outer shell and adhesive shall be slit lengthwise into two equal halves. A smooth gage rod shall be selected, measured and placed in contact with the inside surface of the sleeving or adhesive. The total thickness of the gage rod plus sleeving or adhesive wall shall then be measured. The maximum and minimum wall thickness shall be calculated by subtracting the gage rod measurement from the measurement of the gage rod plus sleeving wall.
- Identification of product: Visually examine for color coding.
- Workmanship: Visually examine with a 3X microscope for any defects which may affect serviceability.

4.8 Test Methods

4.8.1 Insulation Resistance (see 3.5.2.1)

Sleeves shall be tested in accordance with Method 302 of MIL-STD-202. For multiple wire sleeves, the test shall be performed on the largest wire size on each side. The following details shall apply:

- Test condition: B
- Conditioning of device: Sleeves shall be immersed in a bath as specified for at least 1 hour (see 4.4.3).
- Points of measurement: Between wire and water bath.
- Electrification time: 1 minute.

4.8.2 Dielectric Withstanding Voltage (see 3.5.2.2)

Sleeves shall be tested in accordance with Method 301 of MIL-STD-202. The following details shall apply:

- a. Conditioning of device: Sleeves shall be immersed in a bath as specified (see 4.4.3).
- b. Magnitude and nature of potential: 2500 volts (RMS).
- c. Points of measurement: Between wire and water bath.

4.8.3 Slip Resistance Strength (see 3.5.2.3)

Two (2) splice assemblies shall be terminated in accordance with the manufacturer's assembly instructions to maximum wire size (20, 16, and 12). A tensile load specified in the detailed specification shall be applied at the rate of 1 inch per minute and held at the specified load for 60 seconds (see Figure 1).

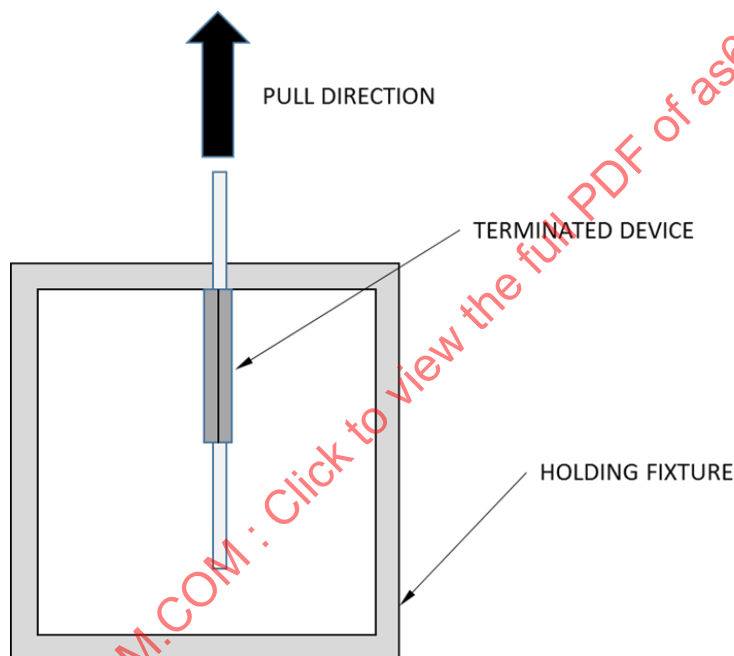


Figure 1 - Type I shown

4.8.4 Environmental Conditioning (see 3.5.2.4)

The sleeves shall be exposed to each of the conditions in the sequence in Tables 1 and 2.

4.8.4.1 Altitude Immersion

The device, immersed in a solution as specified (see 4.4.3) shall be placed in a suitable chamber; the free ends shall be within the chamber and shall not be sealed. The chamber pressure shall be reduced to 75 000 feet (26.78 mm of Hg) and maintained for 30 minutes. The specimen shall be bent at 90 degrees minimum of 2 inches away from the device where the bent wire sections (free ends) shall be placed along the side wall of the vessel. Care shall be taken to not disturb the device joint under test. The chamber shall then be returned to ambient pressure. This shall constitute 1 cycle. A total of 3 cycles shall be run. The insulation resistance shall be measured after the third cycle.

4.8.4.2 Immersion

The device shall be tested in accordance with Method 104, test condition C, of MIL-STD-202.