INCH-POUND

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MILITARY SPECIFICATION

FUSE, CARTRIDGE, INSTRUMENT TYPE, GENERAL SPECIFICATION FOR

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

1. SCOPE

* 1.1 Scope. This specification covers instrument type fuses designed for the protection of electrical, electronic, and communication equipment on direct current (dc) and alternating current (ac) (up to 400 hertz (Hz)) circuits Statistical process control (SPC) techniques are required in the manufacturing process to minimize variation in production of fuses supplied to the requirements of this specification

1.2 Classification.

* 1.2.1 Type designation The type designation of fuses shall be in the following form, and as specified (see 3 1 and 6.2)

FM08	A	125 V	1/2 A	*
Style (1.2.1.1)	Characteristic (1.2.1.2)	Voltage rating (1.2.1.3)	Current rating (1.2.1.4)	Optional finish (1.2.1.5)

1.2.1.1 Style. The style is identified by the letters "FM" followed by a two-digit number, denoting a fuse of a given construction and dimensions.

* 1.2.1.2 Characteristic The characteristic is identified by a one-letter symbol which indicates the relative overload interrupt time (see 6.5) in accordance with table I

TABLE I Characteristics.

Symbol	Relative overload interrupt time
A	Normal
B	Time delay

1.2.1.3 Voltage rating. The voltage rating shall be the maximum direct current (dc) or alternating current (ac) root mean square (rms) voltage for which a fuse is designed (see 3.1). The voltage rating is identified by a numerical value followed by the letter "V".

1.2.1.4 Current rating. The current rating is the amount of current a fuse will carry indefinitely without interruption (see 3.1). The current rating in amperes and fractions of an ampere is identified by a numerical value followed by the letter "A".

* 1.2.1.5 Optional finish. When specified, a suffix letter shall be added to the type designation covered by selected specification sheets to denote optional finish (see 3.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Electronics Supply Center, ATTN: DESC-EMM, 1507 Wilmington Pike, Dayton, OH 45444-5283, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5920

2. APPLICABLE DOCUMENTS

2.1 Government documents

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

* FEDERAL

J-C-30	-	Cable and Wire, Electrical (Power, Fixed Installation)
QQ-N-290	-	Nickel Plating (Electrodeposited).
QQ-S-365	-	Silver Plating, Electrodeposited, General Requirements for.
PPP-B-566	-	Boxes, Folding, Paperboard.
PPP-B-601	-	Boxes, Wood, Cleated Plywood.
PPP-B-621	-	Boxes, Wood, Nailed and Lock-Corner.
PPP-B-636	-	Boxes, Shipping, Fiberboard.
PPP-B-676	-	Boxes, Setup.

* MILITARY

MIL-I-10	-	Insulating Compound, Electrical, Ceramic, Class L
MIL-P-116	-	Preservation, Methods of.
MIL-T-10727	-	Tin Plating, Electrodeposited or Hot-Dipped, for Ferrous and Nonferrous Metals
MIL-F-14072	-	Finishes for Ground Based Electronic Equipment.
MIL-F-14256	-	Flux, Soldering, Liquid (Rosin Base).
MIL-I-16923	-	Insulating Compound, Electrical, Embedding, Epoxy.
MIL-G-45204	-	Gold Plating, Electrodeposited.

(See supplement 1 for list of associated specification sheets.)

STANDARDS

* MILITARY

MIL-STD-129	-	Marking for Shipment and Storage.
MIL-STD-202	-	Test Methods for Electronic and Electrical Component Parts.
MIL-STD-790	-	Product Assurance Program for Electronic and Fiber Optic Parts Specifications.
MIL-STD-1285	-	Marking of Electrical and Electronic Parts.
MIL-STD-2073-1	-	DOD Material, Procedures for Development and Application of Packaging Requirements.
MIL-STD-45662	-	Calibration Systems Requirements.

* (Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

* 2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

* AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B36 - Standard Specification for Brass Plate, Sheet, Strip, and Rolled Bar.

ASTM B121 - Standard Specification for Leaded Brass Plate, Sheet, Strip, and Rolled Bar

ASTM B139 - Standard Specification for Phosphor Bronze Rod, Bar, and Shapes

ASTM B152 - Standard Specification for Copper Sheet, Strip, Plate, and Rolled Bar

ASTM E595 - Standard Test Method for Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment.

ASTM A829 - Standard Specification for Plates, Alloy Steel, Structural Quality.

ASTM D3953 - Standard Specification for Strapping, Flat Steel and Seals

(Application for copies of ASTM publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

* ELECTRONIC INDUSTRIES ASSOCIATION (EIA)

EIA-557 - Statistical Process Control Systems.

(Application for copies should be addressed to the Electronic Industries Association, 2001 Eye Street, N.W., Washington, DC 20005.)

* UNDERWRITERS LABORATORIES INC. (UL)

UL 198C - Standard for High-Interrupting-Capacity Fuses, Current-Limiting Types.
UL 198D - Standard for Class K Fuses.
UL 198E - Standard for Class R Fuses.

(Application for copies should be addressed to Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.)

* (Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents These documents also may be available in or through libraries or other informational services.)

* 2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of conflict between requirements of this specification and the specification sheet, the latter shall govern.

* 3.2 Qualification. Fuses furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.5 and 6.3).

* 3.3 Quality.

* 3.3.1 Product assurance program The product assurance program for fuses furnished under this specification shall be established and maintained in accordance with the procedures and requirements specified in MIL-STD-790 with details as specified in 4.1.3. The implementation of the product assurance program shall be 12 months from the date of this specification.

* 3 3.2 Statistical process control (SPC) The contractor shall implement and use statistical process control techniques in the manufacturing process for parts covered by this specification The SPC program shall be developed and maintained in accordance with EIA-557 The SPC program shall be documented and maintained as part of the overall reliability assurance program as specified in MIL-STD-790 with details as specified in 4.1 3 The implementation of SPC shall be 12 months from the date of this specification. Processes for application of SPC techniques may include but are not limited to

a Cap attachment

b. Application of protective enclosure.

c Application of marking

d Lead treatment for soldering.

e Lead attachment.

f Packaging/identification

3.4. Material The material for each part shall be as specified herein However, when a definite material is not specified, a material shall be used which will enable the fuses to meet the performance requirements of this specification Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.4.1 Restricted material. Flammable or explosive material, or material which can produce toxic or suffocating fumes when the fuses are in service shall not be used in the construction of the fuses.

3.4.2 Case or body.

3.4.2.1 Glass When glass is used, it shall be of high quality, free from strain, and sufficiently clear to permit the enclosed fuse element to be readily seen.

3.4.2.2 Plastic Unless otherwise specified (see 3.1), any plastic insulation may be used, except that cotton base or cotton or cellulose filled molding material shall not be used.

* 3.4.2.3 Ceramic. Ceramic insulation shall be grade L211 or higher grade, in accordance with MIL-I-10.

3.4.2.4 Epoxy Epoxy encapsulant compound shall conform to type B of MIL-I-16923.

* 3.4.3 Current-carrying parts (except fuse element). Current carrying parts shall be of brass, copper, copper alloy, or phosphor bronze conforming to ASTM B36 and ASTM B121 or ASTM A829, ASTM B152, ASTM B36, and ASTM B139, respectively.

3.4.4 Noncurrent-carrying parts. All metal noncurrent-carrying parts shall be of corrosion resistant material or of material adequately protected against corrosion in accordance with MIL-F-14072.

3.5 Design and construction. Fuses shall be of a design, construction, and physical dimensions as specified (see 3.1).

3.5.1 Mounting. Fuses shall be designed to permit convenient insertion and removal from printed wiring boards, fuseclips or holders as specified (see 3.1).

3 5.2 Terminal mounting. Terminals shall be secured to the fuse body so that they shall not loosen. The fuse wire shall be so attached to the terminals that there shall be no danger of breaking the fuse wire or connections when installing the fuse Terminals other than the ends to which the fusible elements are attached shall be free from solder.

3.5.3 Ferrule alignment Fuses with ferrule terminals shall pass through a tubular gauge having a length equal to that of the fuse. The tubular gauge shall have an internal diameter of .005 inch (0.13 mm) greater than the maximum ferrule diameter for fuse lengths up to and including 1.750 inches (44.45 mm). For fuse lengths greater than 1.750 inches (44.45 mm), the tubular gauge shall have an internal diameter .010 inch (0 25 mm) greater than the maximum ferrule diameter.

3 5.4 Indication. When specified (see 3.1), the fuse shall be so designed that it is possible to determine that the fuse is open, without removing the fuse from the circuit.

3.5.5 Terminal finish or plating. Ferrules or other terminals shall be finished (plated, dipped, coated) or shall be natural (no finishing process), as specified (see 3.1). Finish shall be optional when not specifically designated.

3.5.5.1 Silver plating. Silver plating shall be in accordance with QQ-S-365 and shall be 99.9 percent pure silver, not coin silver. It shall be not less than .00008 inch (0.0020 mm) thick.

3.5.5.2 Nickel plating. Nickel plating shall be in accordance with QQ-N-290 and shall be not less than .00008 inch (0.0020 mm) thick over brass and .0002 inch (0.010 mm) over copper.

3.5.5.3 Bright alloy plating. Minimum plating of bright alloy shall be .00008 inch (0 0020 mm) thick for brass terminals and .0002 inch (0.010 mm) for copper terminals. The plating shall be of the following composition:

Copper - 50 to 60 percent
Tin - 25 to 28 percent
Zinc - 14 to 18 percent

3.5.5.4 Tin plating or coating. Tin plating or coating shall conform to MIL-T-10727.

* 3.5.5.5 Gold plating. Gold plating shall conform to MIL-G-45204. Unless otherwise specified (see 3.1), gold plating shall be type II, class I.

3 6 Continuity. Fuses shall have electrical continuity (see 4.8.2)

3.7 Resistance (when applicable (see 3.1)). Fuses shall have electrical resistance as specified (see 3.1 and 4.8.3).

3.7.1 Voltage drop (when applicable (see 3.1)). Fuses shall have the voltage drop specified (see 3.1 and 4.8.3.1).

3.8 Current-carrying capacity. Fuses shall show no evidence of mechanical damage and shall carry current as specified (see 3.1) without electrical failure. Unless otherwise specified, the temperature of the case, body or terminals shall not rise more than 70°C above room ambient temperature (see 3.1 and 4.8.4).

3.9 Terminal strength. Fuse terminals shall not become damaged when subjected to the specified force (see 3.1 and 4.8.5).

* 3.10 Overcurrent.

* 3.10.1 Overload interrupt. Fuses shall open the circuit within the time limits specified (see 3.1) without causing the case or body to char or fracture. The circuit shall remain open without the circuit closing again during the one-minute period after interrupt. There shall be no mechanical failure and the insulation resistance shall be as specified in 3 11 (see 4.8.6.1).

* 3.10.2 Maximum current clearing I^2t (when specified, see 3.1). When fuses are tested as specified in 4 8.6.2, the amount of ampere-squared seconds passed by the fuse during melting, arcing or clearing time shall not exceed the value specified (see 3.1).

* 3.10.3 Short circuit Fuses shall remain intact and shall open the circuit. The fuse shall remain in the energized circuit 1 minute without any indication of the circuit closing again The insulation shall not puncture; the terminals or body shall not rupture or separate, and the terminals shall not be shunted Immediately after removal of the fuse, and in no case not more than 1 minute after removal of the fuse, the insulation shall be as specified in 3 11 (see 4.8.6.3).

* 3.11 Insulation resistance

* 3.11 1 Overload interrupt or maximum clearing I^2t. Unless otherwise specified (see 3.1), the insulation resistance after overload interrupt (see 3.10 1) or maximum current clearing I^2t (see 3 10 2), shall be at least 0.5 megohm (see 4 8 7)

* 3.11.2 Short circuit Unless otherwise specified (see 3.1), the insulation resistance after short circuit (see 3.10.3), shall be at least 0.5 megohm (see 4.8 7).

* 3.12 Outgassing (when specified, see 3.1) When the fuses or the fuse materials are tested as specified in 4.8.8, the materials shall meet the following requirements:

Total mass loss (TML) ----------Shall not exceed 1.0 percent.
Volatile condensable material (VCM)---Shall not exceed 0.1 percent

* 3 13 Vibration

* 3.13 1 Vibration, high frequency When tested as specified in 4.8.9.1, there shall be no electrical or mechanical damage to the fuse

* 3.13.2 Vibration, random (when specified, see 3 1). When tested as specified in 4 8.9.2, there shall be no electrical or mechanical damage to the fuse.

3 14 Shock. When tested as specified in 4 8.10, there shall be no electrical or mechanical damage to the fuse.

3.15 Salt spray (corrosion). When tested as specified 4.8.11, there shall be no evidence of excessive corrosion. Excessive corrosion is defined as that which interferes with the electrical or mechanical performance, or in the case of plated metals, corrosion which has passed through the plating and attacked the base metal. There shall be no warping, cracking, or other electrical or mechanical damage to the fuse.

3.16 Moisture resistance When tested as specified in 4.8.12, there shall be no cracking, peeling, loosening of terminals or evidence of electrolytic corrosion and when labels are used there shall be no evidence of peeling, wrinkling, ends lifting or illegible ink markings

3.17 Thermal shock. When tested as specified in 4.8.13, the fuses shall show no mechanical or electrical damage and there shall be no loosening of the terminals or other parts.

* 3.18 Solderability (when specified, see 3.1). When fuses are tested as specified in 4.8.14, the dipped portion of the leads shall conform to the solid-wire termination criteria of method 208, MIL-STD-202.

* 3.19 Resistance to soldering heat (when specified, see 3.1). When tested as specified in 4.8.15, the fuses shall show no evidence of external damage.

3.20 Marking. Unless otherwise specified (see 3.1), each fuse shall be marked in accordance with method I of MIL-STD-1285, and either 3.20.1 or 3.20.2, or a combination of both.

3.20.1 Ferrule and end cap marking. When fuse ferrules and end caps are marked, the marking shall include the following:

a. Type designation (see 1.2.1).

b. Manufacturer's name, trademark or code symbol.

3.20.2 Labels When fuse labels are used, the following shall apply:

3 20.2 1 Material The label material shall be a pressure sensitive polyester tape, Permacel EE-6951 or equivalent.

* 3 20.2.2 Information Fuse marking shall include the information shown in the following example

Marking	Explanation
Fuse	Component identification
FM08	Style
A or B (as applicable, see 3.1)	Characteristic
125 V	Voltage rating
1/500A	Current rating in amperes
* (as applicable, see 3.1)	Optional finish
Manufacturer's symbol	The manufacturer's identification may be shown on the printed label or may be stamped on the fuse ferrule (or both)

The printing size shall be as large as possible which will permit all of the required information to appear on the label

3 20.2.3 Label size The width of the label for fuses 2 inches (50 80 mm) in length or less shall be such as to almost touch the fuse ferrule on each end of the fuse. For fuses more than 2 inches (50.80 mm) in length, the label shall be large enough that the markings will be legible. The label shall be centered on the fuse. The label shall completely wrap around the fuse body between the ferrules. Overlapping of the label upon itself is permitted, provided it does not overlap any of the printed information. For fuses less than .406 inch (10.31 mm) diameter, the printed information shall run the length of the fuse body from ferrule to ferrule. For other fuse sizes the printed information may run perpendicular to the fuse length.

3.20.2.4 Label color. The label color shall be white. Permanent type alcohol-based printing ink or equivalent shall be used. The color of the printing ink for fuses that have no intentional time delay shall be black; fuses that have an intentional time delay shall be green.

3 21 Workmanship Fuses shall be manufactured and processed in such a manner as to be uniform in quality and shall be free from loose terminals, cracked, or displaced parts, sharp edges, burrs and other defects that will affect life, serviceability or appearance.

3.21.1 Soldering Soldering shall be such as to minimize the spattering of solder and flux onto surrounding surfaces. Only noncorrosive fluxes shall be used, unless it can be shown that all corrosive products have been satisfactorily removed or neutralized after soldering. All soldered connections shall be of such character and quality that the bonding between the soldered items may be determined by visual examination. There shall be no evidence of "cold soldering", and the use of excessive amounts of solder will not be permitted.

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 (examinations and tests) 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with MIL-STD-45662.

* 4.1.3 Quality

* 4.1.3.1 Product assurance program. A product assurance program shall be established and maintained in accordance with MIL-STD-790. Evidence of such compliance shall be verified by the qualifying activity of this specification as a prerequisite for qualification and continued qualification.

* 4.1.3.2 Statistical process control. A statistical process control (SPC) program shall be established and maintained in accordance with EIA-557. Evidence of such compliance shall be verified by the qualifying activity as a prerequisite for qualification and retention of qualification.

* 4.2 Classification of inspection. The inspections specified herein are classified as follows:

a. Materials inspection (see 4.3)

b. Qualification inspection (see 4.5).

c. Quality conformance inspection (see 4.7)

4.3 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials listed in table II, used in fabricating the fuses, are in accordance with the applicable referenced specifications or requirements prior to such fabrication.

4.4 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.5 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with equipment and procedures normally used in production.

4.5.1 Sample size. Unless otherwise specified (see 3.1) the number of samples submitted for qualification shall be 22 each of the maximum and minimum current ratings for which qualification is desired. Four additional samples each of the maximum and minimum ratings shall be forwarded to the qualifying activity.

* TABLE II. Materials inspection.

Material	Requirement paragraph	Applicable specification
Glass	3 4 2 1	
Plastic	3 4 2.2	
Ceramic	3 4.2.3	MIL-I-10
Epoxy	3 4.2.4	MIL-I-16923
Brass	3 4 3	ASTM B36, ASTM B121, ASTM A829
Copper	3 4.3	ASTM B152
Copper alloy	3 4.3	ASTM B36
Phosphor bronze	3 4.3	ASTM B139
Silver plating	3.5.5.1	QQ-S-365
Nickel plating	3.5.5.2	QQ-N-290
Bright alloy plating	3.5.5.3	
Tin plating	3.5.5.4	MIL-T-10727
Gold plating	3.5.5.5	MIL-G-45204
Polyester tape	3.20.2 1	
Print ink	3.20.2 4	

4.5 2 Inspection routine. The sample shall be subjected to the qualification inspection shown in table III, in the order shown All sample units shall be subjected to the inspection of group I The sample shall then be divided as specified in table III for groups II to VI inclusive

4.5.3 Failures. One or more failures shall be cause for refusal to grant qualification approval.

4.5.4 Retention of qualification. To retain qualification, the manufacturer shall forward a report at 12-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of:

a. A summary of the results of the tests performed for inspection of product for delivery, (groups A and B), indicating as a minimum the number of lots that have passed and the number that have failed The results of tests of all reworked lots shall be identified and accounted for.

b. A summary of the results of tests performed for periodic inspection, (group C), including the number and mode of failures The summary shall include results of all periodic inspection tests performed and completed during the 12-month period. If the summary of the test results indicates nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 30 days after the end of each 12-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 12-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit a representative product of each style, voltage rating, and current rating to testing in accordance with the qualification inspection requirements.

* 4.6 Extent of qualification. Qualification between detail specifications shall be in accordance with the applicable detail specifications (see 3.1).

* TABLE III. Qualification inspection.

Inspection	Requirement paragraph	Test method paragraph	Number of sample units per current rating
Group I			All
Visual and mechanical examination	3.5, 3.20 and 3.21	4.8 1	
Continuity	3.6	4.8.2	
Resistance (when specified)	3 7	4.8.3	
Voltage drop (when specified)	3.7 1	4.8.3.1	
Current-carrying capacity	3.8	4 8 4	
Group II (see 3 1)			6
Terminal strength	3.9	4.8.5	
Overload interrupt	3.10.1	4.8.6 1	
Maximum clearing current I^2t (when specified)	3 10 2	4.8.6.2	
Insulation resistance	3.11	4.8 7	
Solderability (when specified)	3.18	4.8.14	
Group III (see 3 1)			4
Short circuit	3.10.3	4.8.6 3	
Insulation resistance	3.11	4.8 7	
Group IV			4
Vibration, high frequency	3.13.1	4.8.9.1	
Vibration, random (when specified, see 3.1)	3 13.2	4.8.9.2	
Continuity	3.6	4.8.2	
Shock	3.14	4.8.10	
Continuity	3 6	4.8.2	
Group V			4
Salt spray (corrosion)	3 15	4.8.11	
Overload interrupt (at room ambient temperature and maximum voltage rating)	3.10.1	4.8.6.1	
Insulation resistance	3.11	4.8.7	
Group VI			4
Outgassing (when specified)	3.12	4.8.8	
Moisture resistance	3.16	4.8.12	
Thermal shock	3.17	4.8.13	
Resistance to soldering heat (when specified)	3 19	4.8.15	
Current carrying capacity (at room ambient temperature)	3.8	4.8.4	
Overload interrupt (at room ambient temperature and maximum voltage rating)	3.10.1	4.8.6.1	
Insulation resistance	3.11	4.8.7	

4.7 Quality conformance inspection

* 4.7.1 Inspection of product for delivery Inspection of product for delivery shall consist of groups A and B inspection. Except as specified in 4 7.2, delivery of products which have passed the groups A and B inspections shall not be delayed pending the results of the group C inspection.

4.7.1.1 Inspection lot. An inspection lot shall consist of all fuses of the same style and current rating produced under essentially the same conditions, and offered for inspection at one time

* 4.7.1.2 Group A inspection Group A inspection shall consist of the inspections specified in table IV, in the order shown. Major and minor defects shall be defined in table V.

* TABLE IV. Group A inspection

Inspection	Requirement paragraph	Test method paragraph
subgroup 1		
Continuity 1/	3.6	4.8.2
Resistance 2/	3.7	4.8.3
Voltage drop 2/	3.7.1	4.8.3.1
subgroup 2		
Visual and mechanical examination	3.5, 3.20 and 3.21	4.8 1

1/ Not required when resistance or voltage drop test is conducted
2/ When applicable (see 3.1).

* 4.7.1.2.1 Subgroup 1 tests. Subgroup 1 tests shall be performed on 100 percent of the product supplied under this specification. All rejected parts shall be removed from the lot and shall not furnished on the contract Lots having more than 5 percent total rejects shall not be furnished on the contract.

* 4.7.1.2.1.1 Manufacturers production inspection. If the manufacturer performs tests equal to or more stringent than those specified in subgroup 1, table IV as the final step of this production process, group A, subgroup 1 inspection may be waived and the data resulting from the manufacturers production tests may be used instead Authority to waive the subgroup 1 inspection shall be granted by the qualifying activity only. The following criteria must be complied with.

a. Tests conducted by the manufacturer during production shall be clearly identical to or more stringent than that specified for subgroup 1. Test conditions shall be equal to or more stringent than those specified for subgroup 1.

b. Manufacturer subjects 100 percent of the product supplied under this specification to his production tests.

c. The parameters measured and the failure criteria shall be the same or more stringent than those specified herein.

d. The lot rejection criteria is the same or more stringent than that specified herein.

e. The manufacturer shall make available all information concerning the test procedures and instrumentation used in his production tests. The manufacturer shall also make available to the Government all records of all detail test data resulting from production tests.

* 4 7 1.2.2 Subgroup 2 . Subgroup 2 tests shall be performed on an inspection lot basis in accordance with 4.7 1.2.2.1

* 4.7.1.2.2 1 Sampling plan A sample of parts shall be randomly selected in accordance with table VI, if one or more defects are found, the lot shall be rescreened and defects removed. After screening and removal of defects, a new sample of parts shall be randomly selected in accordance with table VI, if one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

TABLE V. Major and minor defects.

Categories	Defects
Major	
1	Material not as specified (see table II)
2	Ferrule and terminal mounting not as specified (see 3 5.2 and 3.5.3)
3	Fuses will not pass through gauge as specified (see 3.5.3)
4	Terminal finish not as specified (see 3.5.5).
5	Fuse does not have continuity (see 3.6).
6	Broken glass or insulating material (see 3.10 and 3 12 through 3 17)
7	Marking Incorrect type designation (see 3.20).
8	Dimensions out of tolerance.
9	Label peeling (when applicable)
Minor	
10	Illegible or improperly located markings (see 3.20).
11	Minor cuts, scratches, burrs and nicks not impairing function.
12	Incomplete removal of soldering flux residue.
13	Other evidence of poor workmanship not affecting the function of the fuse.

* TABLE VI Group A and B, zero defect sampling plan.

Lot size	Sample size		
	Group A, subgroup 2		Group B
	Major	Minor	
2 to 8	100 percent	3	5
9 to 25	13	3	5
26 to 50	13	5	5
51 to 90	13	6	7
91 to 150	13	7	11
151 to 280	20	10	13
281 to 500	29	11	16
501 to 1,200	34	15	19
1,201 to 3,200	42	18	23
3,201 to 10,000	50	22	29

4 7.1.3 Group B inspection. Group B inspection shall consist of the inspections specified in table VII, in the order shown, and the sample shall be selected from inspection lots that have passed the group A inspection.

* 4.7.1.3.1 Sampling plan A sample of parts shall be randomly selected in accordance with table VI, if one or more defects are found, the lot shall be rescreened and defects removed After screening and removal of defects, a new sample of parts shall be randomly selected in accordance with table VI, if one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification

TABLE VII Group B inspection

Inspection	Requirement paragraph	Test method paragraph
Current-carrying capacity (at room ambient temperature)	3.8	4.8.4
Terminal strength	3.9	4.8.5
Overload interrupt (at room ambient temperature)	3.10.1	4.8.6.1
Insulation resistance	3.11	4.8.7
Solderability (when specified, see 3.1)	3.18	4.8.14

* 4.7.1.3.2 Disposition of sample units. Sample units which have been subjected to group B inspection shall not be delivered on the contract.

4.7.2 Periodic inspection. Periodic inspection shall consist of group C Except where the results of these inspections show noncompliance with the applicable requirements (see 4.7.2.1.4), delivery of products which have passed groups A and B shall not be delayed pending the results of these periodic inspections.

4.7.2.1 Group C inspection. Group C inspection shall consist of the inspections specified in table VIII, in the order shown for each subgroup. Group C inspection shall be made on sample units selected from inspection lots which have passed the group A and B inspections, unless the Government considers it more practical to select a sample from current production. A manufacturer's normal quality control tests, production tests, environmental tests, and so forth, may be used to fulfill all or part of group C inspection; however, all of group C inspection shall be completed as specified.

4 7.2 1 1 Sampling plan. Unless otherwise specified, 22 sample units each of the maximum and minimum ratings shall be selected, from those covered by a single specification sheet, 24 months after the date of notification of qualification and after each subsequent 36-month period; except for subgroup 3, which shall be selected on a 48-month basis The sample units shall be subdivided into subgroups shown in table VIII When production of a particular type of fuse has been suspended for 24 months or more, sample units shall be selected from the first lot of the new production presented for acceptance, and after each subsequent 24-month period; except for subgroup 3, which shall be on a 48-month basis.

4.7.2.1.2 Failures. If one or more sample units fail to pass group C inspection, the sample shall be considered to have failed.

4.7.2.1.3 Disposition of sample units. Sample units which have been subjected to group C inspection shall not be delivered on the contract.

* TABLE VIII. Group C inspection.

Inspection	Requirement paragraph	Test method paragraph	Number of sample units per current rating
Subgroup 1			4
Short circuit	3.10.3	4.8.6.3	at maximum
Insulation resistance	3 11	4.8 7	voltage rating
Subgroup 2			6
Terminal strength	3.9	4.8.5	at maximum
Overload interrupt	3.10.1	4.8.6.1	voltage
Maximum clearing current I^2t (when specified, see 3.1)	3.10.2	4.8.6.2	rating
Insulation resistance	3.11	4.8.7	
Subgroup 3			4
Vibration, high frequency	3.13.1	4 8.9.1	
Vibration, random (when specified)	3.13.2	4.8.9.2	
Continuity	3.6	4.8.2	
Shock	3 14	4.8.10	
Continuity	3.6	4.8.2	
Resistance to soldering heat (when specified, see 3.1)	3.19	4.8.15	
Subgroup 4			4
Salt spray (corrosion)	3.15	4.8.11	
Overload interrupt (at room ambient temperature and maximum voltage rating)	3.10.1	4.8.6.1	
Maximum clearing current I^2t (at room ambient temperature and maximum voltage rating) (when specified, see 3.1)	3.10.2	4.8.6.2	
Insulation resistance	3.11	4.8.7	
Subgroup 5			4
Moisture resistance	3.16	4.8.12	
Thermal shock	3.17	4.8.13	
Current-carrying capacity (at room temperature and maximum voltage rating)	3.8	4.8.4	

4.7.2.1.4 Noncompliance. If a sample fails to pass group C inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which were manufactured under essentially the same conditions with essentially the same materials, processes, etc., and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity has been taken. After the corrective action has been taken, group C inspection shall be repeated on additional sample units (all inspections, or the inspection which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstituted; however, final acceptance and shipment shall be withheld until the group C inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity.

4 7.3 Inspection of packaging The sampling and inspection of the preservation and interior pack marking shall be in accordance with the groups A and B quality conformance inspection requirements of MIL-P-116 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

4.8 Methods of examination and test.

4 8 1 Visual and mechanical examination Fuses shall be examined to verify that the materials, design and construction, physical dimensions, marking and workmanship are in accordance with the applicable requirements (see 3.1 through 3 5, 3.20 and 3.21).

4.8.2 Continuity (see 3.6). Continuity of each fuse shall be determined by use of a low voltage ohmmeter or other suitable method.

4.8.3 Resistance (see 3.7) Resistance shall be measured with a Wheatstone bridge, Kelvin bridge, or equivalent sensitive instrument or calculated from the voltage drop (see 4.8.3.1). Measurements shall be taken at room ambient temperature and as close to the fuse element as practicable.

4.8.3.1 Voltage drop (see 3.7.1). Voltage drop shall be measured using a dc voltmeter having a minimum input impedance of 11 megohms with measurements taken at room ambient temperature and as close to the fuse element as practicable.

* 4.8.4 Current-carrying capacity (see 3.8). Unless otherwise specified (see 3.1), fuses shall be subjected to an alternating or direct current of 100 percent of rated current. For qualification inspection (group I) the samples shall be apportioned and submitted to the test at -55°C to -60°C, at 20°C to 35°C (room ambient temperature), and at the maximum rated temperature for the fuse (see 3.1). The tolerance at the maximum rated temperature shall be -0°C and +5°C. For group B, the inspection shall be done only at room ambient temperature. The test current shall be as specified (see 3.1). The current shall be maintained for 30 minutes after the temperature of each fuse has stabilized, but shall be applied for not less than 1.5 hours. It may be assumed that the temperature has stabilized when three consecutive temperature readings taken at 10-minute intervals show no rise in temperature. Fuses shall be mounted in a fuseholder as specified (see 3.1). When two or more fuses are tested in series, the fuseholders shall be located so that there will be a spacing of not less than 6 inches (152.4 mm) between any two fuses under test The wire connecting the fuseholders together and connecting the fuseholders to the ammeter and the source of supply shall be size 8, (unless otherwise specified), and shall be in accordance with J-C-30. The length of wire between fuseholders shall be 2 feet (609.6 mm) The temperature of the fuse case or body and of the terminals shall be measured by thermocouples (wire size 28 to 32 AWG).

4 8.5 Terminal strength (see 3.9) Unless otherwise specified, terminals shall be tested in accordance with method 211, test condition A or E, as applicable, of MIL-STD-202. Forces shall be as specified (see 3 1), and shall be applied to individual terminals as follows

a. Plug or lead type terminals

   (1) Along terminal axis.

   (2) Perpendicular to terminal axis.

b. Ferrule type terminals. Torque.

* 4.8.6 Overcurrent.

* 4 8.6.1 Overload interrupt (see 3.10.1). Fuses shall be subjected to the percentage of rated current and voltage specified (see 3.1); for qualification (group II) and group C inspection (subgroup 2) the sample fuses shall be apportioned and submitted to the tests as specified (see 3.1), at -55°C to -60°C, at 20°C to 25°C (room ambient temperature) and at maximum rated temperature The tolerance at the maximum rated temperature shall be -0°C, +5°C. The fuses shall be maintained at the test temperature for a minimum of 30 minutes, prior to the actual application of the test current. For qualification and group C inspections the power supply shall have an open-circuit voltage of not less than that of the specified voltage rating of the fuse under test For group B, the inspection shall be done only at room ambient temperature and the power supply may be of any value which is not less than 6 volts. For the qualification and group C inspections the fuses shall be left in the circuit for 1 minute after blowing without any indication of the circuit reclosing, and insulation resistance readings shall be taken within 1 minute following the removal of the test voltage. Opening time measurements shall be made with an oscillograph for periods shorter than 1 second, a synchronous timer may be used for measurements longer than 1 second; a stop watch is suitable for measurements of longer than 10 seconds. Following the test, insulation resistance shall be measured as specified in 4.8.7.

* 4.8.6.2 Maximum current clearing (I^2t)(see 3.10.2). The maximum clearing I^2t shall be determined from an oscillogram showing the current trace. The determination shall be made by application of Simpson's rule or the use of an integrating planimeter as shown in U.L Standards 198C, 198D, or 198E. Fuses shall be subjected to rms symmetrical currents with a tolerance of +20, -0 percent. The power factor shall be 95 to 100 percent. The closing angle shall be essentially at zero of the voltage wave (maximum offset) or later, so as to produce start of arcing within 30 electrical degrees prior to system peak voltage. The test voltage shall be not less than the rated voltage of the fuse (see 3.1). The maximum peak voltage occurring during the interruption shall be not more than 3000 volts. This voltage shall be measured with an instrument having a frequency response that is linear from 50 to 300 hertz.

* 4.8.6.3 Short circuit (see 3.10.3). Fuses shall be subjected to the tests at the current and voltage specified (see 3.1). The direct current tests shall be made using appropriate generating equipment as a source of power and with the rate of current rise for the test circuit adjusted for at least 3.25×10^6 amperes per second. The alternating current tests shall be conducted using an alternating current supply of adequate capacity and shall be on a single phase basis. Unless otherwise specified (see 3.1), the current shall be applied within ±10° of zero point of the voltage wave and the circuit power factor shall be 0.85 to 0.95. Short circuit currents shall be determined by means of an oscillograph. Test circuits shall be calibrated for the specified current with the applicable fuseholder (see 3.1) short-circuited. Following the test, insulation resistance shall be measured as specified in 4.8.7.

* 4.8.7 Insulation resistance (see 3.11) Fuses shall be tested after overload interrupt (see 3 10.1) or maximum current clearing I^2t (see 3.10.2) and short circuit (see 3.10.3) in accordance with method 302 of MIL-STD-202. The following details shall apply:

a Test condition A

b. Points of measurement. Between terminals.

c. Following the test, fuses shall be examined for compliance with 3.11.

* 4.8.8 Outgassing (see 3.12). The fuses or fuse materials shall be tested as specified in ASTM E595.

* 4.8.9 Vibration (see 3.13).

* 4.8.9.1 Vibration, high frequency (see 3.13.1). The fuses shall be subjected to vibration tests in accordance with method 204 of MIL-STD-202. The following details shall apply:

a. Mounting: In applicable fuseholder (see 3.1)

b. Test condition C.

c. One-half of the sample units shall be tested while carrying 100 percent of rated current and the balance tested with no current All sample units shall be tested for continuity as specified in 4.8.2 at the end of test

* 4 8.9.2 Vibration, random (see 3.13.2) The fuses shall be subjected to vibration tests in accordance with method 214 of MIL-STD-202. The following details shall apply

a Mounting In applicable fuseholder (see 3 1)

b Test condition I, letter E

c Duration shall be as specified (see 3 1)

d One-half of the sample units shall be tested while carrying 100 percent of rated current and the balance tested with no current. All sample units shall be tested for continuity as specified in 4.8 2 at the end of test.

4 8 10 Shock (see 3 14). Fuses shall be tested in accordance with 4.8.10 1 or 4.8 10.2, as specified (see 3.1).

4 8.10.1 Method I. Fuses shall be tested in accordance with method 213 of MIL-STD-202. The following details and exceptions shall apply:

a. Mounting method and accessories: Fuses shall be mounted in or on applicable fuseholder (see 3 1).

b Test condition I, unless otherwise specified (see 3 1).

c Measurements before and after test One-half of the sample units shall be tested while carrying 100 percent of rated current (see 3 1), and the remainder with no current. All fuses shall be tested before and after test for continuity as specified in 4.8.2

4.8.10 2 Method II. Fuses shall be tested in accordance with method 207 of MIL-STD-202 The following details and exceptions shall apply·

a. Mounting fixtures: Fuses shall be tested in or on applicable fuseholder, mounted on fixture 207-4A of MIL-STD-202.

b. Electrical load on operating conditions: One-half of the sample units shall be tested while carrying 100 percent of rated current (see 3.1), the remainder with no current.

c Measurement: All fuses shall be tested before and after test for continuity as specified in 4.8.2

4 8.11 Salt spray (corrosion) (see 3 15). Fuses shall be tested in accordance with method 101 of MIL-STD-202. The following details shall apply

a. Five percent salt solution.

b. Test condition B.

c. Following the drying period, the fuses shall be subjected to 100 percent of rated current for 1 hour.

d. Following the test, fuses shall be examined for compliance with 3.15.

4.8.12 Moisture resistance (see 3.16). Fuses shall be tested in accordance with method 106 of MIL-STD-202. The following details and exceptions shall apply:

a. Mounting: Normal mounting means on a noncorrosive metal panel positioned 15 degrees from the vertical with the terminal down.

b. Polarizing voltage shall be 100 volts dc.

c. Steps 7a and 7b are not applicable.

d. Following the test, the fuses shall be examined for compliance with 3.16 and when polyester tape labels are used, compliance with 3.20.2 1.

4 8 13 Thermal shock (see 3.17). The fuses shall be subjected to thermal shock tests in accordance with method 107 of MIL-STD-202 The following details shall apply·

a Test condition A or B as specified (see 3 1)

b Examination after test Fuses shall be examined for compliance with 3 17

4 8 14 Solderability (see 3.18) Fuses shall be tested in accordance with method 208 of MIL-STD-202 (both leads on each fuse shall be tested)

4 8.15 Resistance to soldering heat (see 3.19). Fuses shall be tested in accordance with method 210 of MIL-STD-202 The following details and exceptions shall apply

a Measurement before test: Continuity shall be measured as specified in 4.8.2.

b Special preparation of the specimen: Gold plated leads shall have the gold removed by single or double dipping into a flowing or nonflowing hot solder of sufficient volume to assure complete gold removal Both leads shall be dipped in RMA flux per MIL-F-14256 for a period of 5 ±2 seconds, after which they shall be pre-tinned by immersion into solder for 3 to 5 seconds. The solder shall be maintained at +260°C ±5°C The leads shall be immersed to within .150 ±.025 inch (3.81 ±0.64 mm) of the body of the fuse. The fuses shall then be assembled onto the mount board. The mount board shall not be metal clad.

c. Test condition C, except time duration shall be 5 seconds, ± 2 seconds.

d Cooling time· 5 minutes minimum

e. Measurements after test: Continuity shall be measured as specified in 4.8.2

f. Examination after test: Fuses shall be examined for evidence of mechanical damage when visually inspected at 7X.

5. PACKAGING

5 1 Preservation-packaging The requirements for packaging shall be level A, B, or C, as specified (see 6.2).

5.1 1 Level A

5.1.1.1 Cleaning Fuses shall be cleaned in accordance with MIL-P-116, process C-1.

5.1.1.2 Drying Fuses shall be dried in accordance with MIL-P-116.

5 1.1.3 Preservative application. Preservatives shall not be used.

5.1.1.4 Unit packaging Unless otherwise specified in the contract (see 6.2), fuses shall be unit packed five each in accordance with method III of MIL-P-116 ensuring compliance with the applicable requirements of that specification.

5.1.1.5 Intermediate packaging. Fuses, unit packed as specified in 5.1.1.4, shall be placed in intermediate containers conforming to variety 2 of either PPP-B-566 or PPP-B-676, or class weather resistant of PPP-B-636. Intermediate containers shall be uniform in size, shape and quantities, shall be of minimum tare and cube, and shall contain multiples of five unit packs not to exceed 100 unit packs. No intermediate packs are required when the total quantity shipped to a single destination will result in only one intermediate pack per shipping container.

5.1.2 Level B. The requirement for level B shall be as specified for level A except that any variety of the intermediate containers specified may be used (see 5.1.1.5).

5.1.3 Level C. The level C preservation for fuses shall conform to the MIL-STD-2073-1 requirements for this level.

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

5 2 1 Level A Fuses, preserved as specified in 5 1, shall be packed in wood boxes conforming to PPP-B-601, overseas type or PPP-B-621, class 2 Closure and strapping shall be in accordance with the applicable container specification except that metal strapping shall conform to ASTM D3953. The requirements for level B packing shall be used when the total quantity of a stock numbered fuse for a single destination does not exceed a packed volume of one cubic foot (0.0283 cubic meter)

5.2.2 Level B Fuses, preserved as specified in 5.1, shall be packed in fiberboard containers conforming to PPP-B-636, class weather resistant, style optional, special requirements. The requirements for box closure, waterproofing, and reinforcing shall be in accordance with method V of the PPP-B-636 appendix

5.2.3 Level C. Fuses, preserved as specified in 5.2, shall be packed in fiberboard containers conforming to PPP-B-636, class domestic, style optional, special requirements. Closures shall be in accordance with the appendix thereto.

5.3 Marking. In addition to any special or other identification marking required by the contract (see 6.2), each unit, intermediate, and exterior container shall be marked in accordance with MIL-STD-129. The complete military or contractor's type designation, as applicable (including the CAGE), shall be marked on each unit and intermediate pack in accordance with the identification marking provisions of MIL-STD-129.

5.4 General

5.4.1 Exterior containers. Exterior containers (see 5.2.1, 5.2.2 and 5.2.3) shall be of a minimum tare and cube consistent with the protection required and shall contain equal quantities of identical stock numbered items to the greatest extent practicable.

5.4.2 Packaging inspection. The inspection of these packaging requirements shall be in accordance with 4.7.3.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use.

6 1.1 Fuses. Fuses covered by this specification are intended for use in electronic and low power electrical equipment where relatively low values of short circuit currents are encountered. The fuse primarily provides protection and isolation for the equipment itself. These fuses are designed to endure environmental requirements not specified in MIL-F-15160.

6.1.2 CAUTION. Application of fuses must be made within the short circuit current and voltage ratings shown on the applicable specification sheet. The available short circuit current of the system in which the fuse is applied shall not exceed the short circuit current rating of the fuse. Use of fuses beyond these requirements may be dangerous to personnel and cause damage to the equipment.

Fuses covered by this specification may be safely applied in circuits having a lower voltage than shown as the maximum for the particular fuse provided the short circuit current rating of the fuse is not exceeded. Fuses should never be applied in circuits having voltages greater than the specified maximum fuse voltage rating.

6.1.3 Selected items. Equipment designers should refer to MIL-STD-1360, "Fuses, Fuseholders and Associated Hardware, Selection and Use of", for a selection of fuse types preferred for use in new equipment design.

6.1.4 Packaging requirements. The preservation, packing, and marking specified herein are intended for direct shipments to the government. Unless otherwise designated, the minimum packaging provisions herein are also intended for the preparation of these fuses for shipment form the parts manufacturer to nongovernment activities.

* 6.2 Acquisition requirements Acquisition documents must specify the following:

a Title, number, and date of the specification

b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1 and 3 1)

c. Inspection of commercial packaging (see 4 7.3)

d Levels of packaging required (see 5 1 and 5.2)

e. Quantity per unit pack if other than specified (see 5.1 1.4).

f. If special or additional identification marking is required (see 5.3).

* 6.3 Qualification With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in the applicable Qualified Products List, whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification, in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Space and Naval Warfare Systems Command, SPAWAR 003-114, Washington, DC 20363-5100; however, information pertaining to qualification of products may be obtained from either the Space and Naval Warfare Systems Command or the Defense Electronics Supply Center (DESC-EQ), Dayton, Ohio 45444, agent for administration of the Qualified Products List.

* 6.3.1 Application for qualification Application for qualification tests shall be made in accordance with SD-6 "Provisions Governing Qualification" which may be obtained upon application to Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

* 6.4 Supersession data. This specification includes the essential requirements of previous revisions and supersedes previous type designations (see 3.1).

* 6.4 1 Background. Previous requirements for fuse style FM03 and FM06 included a current-carrying capacity rating at 100 percent of the nominal current rating This prevented a direct correlation between style F03 fuses of MIL-F-15160, which were rated at 110 percent, and the FM03 and FM06. In an attempt to provide this highly desirable correlation, the style FM09 has been developed. FM09A will have normal interrupt characteristics and the FM09B will have an intentional time delay (see 1.2.1.2 and 6.5) This will provide a direct correlation between the F03A and the FM09A, and between the F03B and the FM09B. The main difference between the styles F03 and FM09 being the known environmental capability of fuses furnished under MIL-F-23419.

* 6.4.2 Cross reference. Specific cross-reference will be provided on the specification sheet.

* 6.5 Characteristics. The term characteristic refers to the relative overload interrupt capability of a fuse as follows:

Characteristic A: Commonly referred to as "normal" or "instantaneous". This fuse contains a single element with no intentional time delay designed into the element, only maximum opening time is specified.

Characteristic B: Commonly referred to as "time delay". This is a dual element fuse, each element with a different time/current characteristic; maximum and minimum time is specified.

* 6.6 Conditions for use of level B preservation. When level B preservation is specified (see 5.1.2), this degree of protection should be used for the acquisition of fuses for the resupply worldwide under known favorable handling, transportation, and storage conditions

* 6.7 Subject term (key word) listing

Amperes
Circuit protection
Continuity
Current-carrying capacity
Current limiting
Maximum current clearing (I^2t)
Overload interrupt
Overload protection
Short circuit
Time delay

6.8 Changes from previous issue The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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I RECOMMEND A CHANGE:	1 DOCUMENT NUMBER	2 DOCUMENT DATE (YYMMDD)
	MIL-F-23419E	1 August 1992

3 DOCUMENT TITLE

FUSE, CARTRIDGE, INSTRUMENT TYPE, GENERAL SPECIFICATION FOR

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON	e. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE (Include Area Code) (1) Commercial	(2) AUTOVON
Defense Electronics Supply Center Attn: DESC-EMM (T. Westphal)	(513) 296-6189	986-6189
c. ADDRESS (Include Zip Code) 1507 Wilmington Pike Dayton, OH 45444-5283	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	

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