

INCH-POUND

MIL-PRF-29504/4C  
29 July 2004  
SUPERSEDING  
MIL-T-29504/4B  
7 June 1991

PERFORMANCE SPECIFICATION SHEET

TERMINI, FIBER OPTIC, CONNECTOR, REMOVABLE, ENVIRONMENT RESISTING,  
PIN TERMINUS, SIZE 16, REAR RELEASE, MIL-DTL-38999, SERIES I, III, AND IV

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

The requirements for acquiring the product described herein  
shall consist of this specification and MIL-PRF-29504.

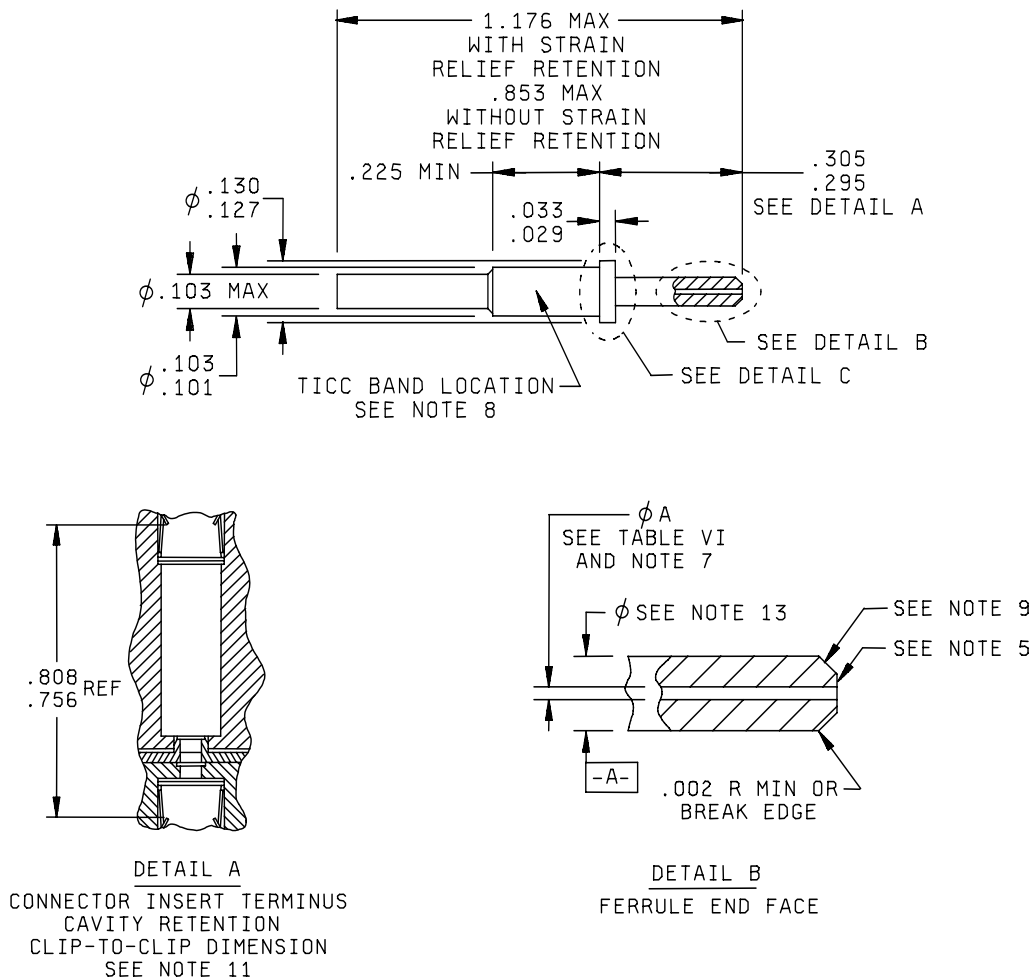
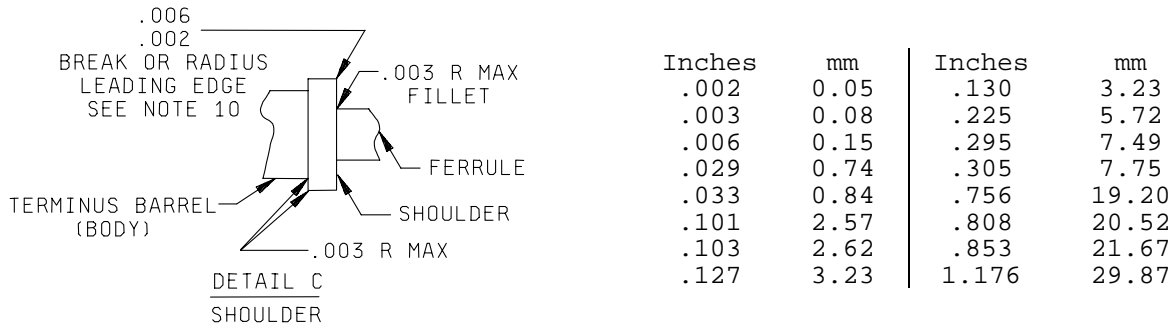


FIGURE 1. Pin terminus

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NOTES:

1. Dimensions are in inches, except diameter "A" which is dimensioned in metric microns only.
2. Metric equivalents are given for general information only.
3. Unless otherwise indicated, all diameters are to be concentric with respect to datum A within .003 inch (0.08 mm).
4. Dimensions apply after plating when applicable.
5. Ferrule end face may be flat or have a radius that does not exceed a curvature of 10 mm. Recommend inspection documentation advise that an end face curvature of 25 mm falls between that of a flat end face and one with a curvature of 10 mm.
6. "A" diameter hole tolerance is specified in table VI.
7. Hole circular runout in table VI relative to datum A.
8. Manufacturer's symbol or trademark location is in front of the first TICC band (see figure 1 of MIL-PRF-29504).
9. Ferrule surface shown to have either a chamfer within 25° to 65° angle x .010 minimum or a .010 R minimum.
10. Optional dimension: Maximum allowable edge break is .015 inch (0.38 mm).
11. Termini qualified to this specification sheet shall meet the performance requirements when inserted into a connector with the clip-to-clip dimension specified.
12. Terminus design shall accommodate a single fiber cable with a maximum diameter of .087 inch (2.2 mm).
13. Ferrule diameter for ceramic: .06246 to .06250 inches (1.5865 to 1.5875 mm), ferrule diameter for metal: .06240 to .06248 inches (1.5850 to 1.5870 mm).
14. For interoperability with a standardized polishing puck, the following shall apply: Length of ferrule protrusion from the terminus barrel (body) for the style 1 and style 3 pin terminus (length from ferrule end face to front of shoulder) shall be 0.266 ± .004 inch. Length of ferrule protrusion from the terminus barrel (body) for the style 2 pin terminus shall be .270 ± .004 inch.

FIGURE 1. Pin terminus - Continued.

REQUIREMENTS:

Design and construction:

Dimensions and configuration: See figure 1 and table VI. Termini may have either flat or radiused end faces. Regardless of the end face geometry, the terminus shall meet the requirements of this specification when terminated using the procedures specified.

Weight: 1.0 gram maximum.

Fabrication procedure. Standard fabrication procedure (for terminus placement/termination onto the end of an optical fiber), including epoxy specified in the procedure, shall be used for test sample terminations. Equivalent fabrication procedure may be used if approved by the qualifying activity prior to test sample preparation.

Cable strain relief capture mechanism. Three styles for a capture mechanism are specified for this terminus design (see table VI). Cable strain relief capture mechanism shall not interfere with intended sealing performance of wire grommet seal, a component in the MIL-DTL-38999 connector, or with the functionality of the insertion and removal tools (see table VII).

Style 1: captive strength member outside barrel (body) with shrink sleeve.

Style 2: captive strength member inside terminus barrel (body).

Style 3: captive strength member outside terminus barrel (body) with crimp sleeve. The terminus shall meet all the requirements when the crimp sleeve is assembled to the terminus using a crimp die with flats measuring  $2.235 \pm .025$  mm ( $.088 \pm .001$  in) across and 3.81 mm (.150 inch) maximum long. The crimp die may contain an optional jacket retention dimple on both the upper and lower die. The optional jacket retention dimple shall have a radius of  $0.500 \pm 0.050$  mm ( $.020 \pm .002$  inch), maximum height above the flat of 0.200 mm (.008 inch) and be positioned in the vertical center of the top and bottom flat (180 degrees apart) and  $1.016 \pm .127$  mm ( $.040 \pm .005$  inch) from the end of the die (or rear end of the terminus). Crimp sleeve to be supplied with terminus when specified in PIN.

Tools: See table VII.

Mating terminus: MIL-PRF-29504/5.

Circular run-out: Not greater than the value specified in table VI.

Qualification inspection. Inspections and sequence shall be performed as listed in table I.

Frequency of terminus end face cleaning. Unless otherwise specified, terminus may be cleaned before or after each test if the connector is demated. Cleaning shall not be performed during the ten successive mates for the insertion loss test. Unless otherwise specified, cleaning may be performed during mating durability before each optical transmittance measurement. Terminus end face cleaning shall be performed for the post optical transmittance measurement after the salt spray test. The optical transmittance measurement is performed after the general cleaning and inspection for corrosion. Cleaning may be performed at other times when degradation in optical performance occurs. Cleaning performed as a corrective action for degraded optical performance shall be noted on the data sheet. Unless otherwise specified, cleaning of the optical end faces is to occur without removal of termini from the connector.

Inspections for un-terminated termini:

Test sample configuration. Test fixture for this test shall include MIL-DTL-38999 shell size 11, 13, or 17, Series III connectors, utilizing both plug and receptacle for retaining the termini during testing. A minimum sample size shall be used to ensure sufficient quantity for termini inspections as part of a single fiber cable and for termini inspections as an integral part of a multiple fiber connector.

Identification markings. The Termini Identification Color Coding (TICC) bands shall be marked on the barrel of the termini. Manufacturer's symbol or trademark shall be in accordance with note 8 of figure 1. The manufacturer shall list the symbol or trademark with SAE in accordance with AIR 1351.

Terminus insertion and removal forces. Not applicable.

Terminus retention. Terminus displacement measurement is not applicable. Test may be used as one operational means to verify acceptable shoulder construction.

Terminus engagement and separation force. Test is applicable for counterpart socket terminus (MIL-PRF-29504/5) with split alignment sleeves.

Maintenance aging. Not applicable.

Fungus resistance. Not applicable.

Ozone. Not applicable.

Inspections for the terminus as part of a single fiber cable:

Test sample configuration. Each terminus is to be terminated on one end of a single fiber cable. Cable used is to have provisions compatible with termini strain relief, as applicable. Termini, selected from the group that underwent inspections for un-terminated termini, shall be used. A minimum sample size of 16 pin termini and 16 of the applicable counterpart socket termini, selected from the group that underwent inspections for un-terminated termini, shall be used.

TABLE I. Qualification inspections

Test procedure
Unterminated termini
Group 1
Size
Weight
Identification markings
Workmanship
Circular run-out
Group 2
Terminus retention
Terminus engagement and separation forces
Terminus cleaning
Group 3
None
Group 4
None
Termini as part of single fiber cable
Group 1
None
Group 2
None
Group 3
Fiber pullout force
Cable pullout force
Group 4
Salt spray
Termini in multiple termini connector
Group 1
Interoperability
Optical
Insertion loss (initial)
Return loss (single mode only)
Group 2
Mating durability
Terminus cleaning
Return loss (single mode only)
Mechanical tests
Shock
Vibration
Insertion loss (verification)
Return loss (single mode only)
Terminus engagement and separation forces

TABLE I. Qualification inspections - Continued.

Group 3
Environmental tests
Thermal shock
Temperature life
Insertion loss (verification)
Return loss (single mode only)

Fiber pull out force. Not applicable (This test is used for terminus configurations with no type of cable strain relief).

Cable pull out force. Applicable for terminus configurations with any mechanism for cable strain relief. The change in optical transmittance shall be measured after the test for a socket terminus, during and after the test for a pin terminus.

Installation note: When a pull on the fiber occurs, the socket terminus displacement may be sufficient to affect the optical transmittance during an applied force.

Salt spray. Test samples (termini on single fiber cable) shall be tested to EIA/TIA-455-16, test condition C. No corrosive effects shall be seen on the external terminus parts that would be detrimental to the operation of the connector. No optical degradation shall occur as a result of this test. An insertion loss test using MIL-DTL-38999 shell size 11, 13 or 17 Series III connectors shall be performed to determine if this optical requirement is met. Insertion loss testing shall be performed prior to and after the salt spray test.

Inspections for termini as an integral part of a multiple termini connector:

Test sample configuration: Four test samples (mated connector assemblies) shall be used for Group I inspections except for interoperability. Two of these four mated connector assemblies shall be used for group II inspections and two for Group III inspections. Each mated connector assembly shall be comprised of a cable assembly with termini placed into MIL-DTL-38999 shell size 17 or higher, Series III connectors. These termini/connectors are located in the middle of the cable assembly. Termini, selected from the group that underwent inspections for un-terminated termini, shall be used and inserted into MIL-DTL-38999 shell size 17 or higher, Series III connectors as part of the cable assembly that comprises each test sample. Cable assembly length shall be 10 meters with the connector mated pair inserted 5 meters from the cable ends. Cable length may be longer (with added cable at the optical source end) if cut-backs are performed to verify insertion loss. Each connector shall be fully populated with termini. At least 8 randomly selected termini pairs in each cable assembly shall be monitored for optical transmittance after, and when specified, during, environmental and mechanical testing. Insertion loss shall be performed on all termini pairs in each cable assembly. Connectors used in the cable assembly, both the plug and receptacle types, are to include backshells. Selection of the backshell is to include assurance of proper strain relief for each single fiber cable and not cause degradation in optical performance.

Interoperability. Applicable, except test for terminus insertion and removal forces is not required. Testing shall be performed using two separately designated cable assemblies with shell size 25 connectors. As part of the interoperability inspection, terminus on the end of single fiber cable, shall be inserted and removed from the connector to verify that the strain relief is compatible with the tools listed in table VII. At the discretion of the preparing activity, selected configurations may be specified to undergo inspections for shock, vibration and mating durability. Interoperability is applicable only for termini among vendors with the same TICC (i.e., fiber size, ferrule hole diameter and ferrule material. See table VI). Qualification by similarity will be given to a terminus in the same row in table VI as the terminus tested for interoperability. This qualification by similarity is valid if the only difference between the terminus tested for interoperability and the terminus configuration in the same row in table VI is a different cable strain relief capture mechanism and TICC markings.

Optical source wavelength. Termini with single mode fiber shall be tested using an optical source at the 1310 nm wavelength. Termini with multimode fiber can be tested using an optical source at either the 850 nm or the 1,300 nm wavelength.

Launch conditions shall be as follows:

- a. Single mode. Ensure that there is a 2 meter minimum length of fiber between the optical source and the test sample; otherwise use a 2 meter minimum length launch cable.
- b. Multimode 50/125 and 62.5/125 micron fiber sizes. Launch condition shall be a 70/70 restricted launch. Use a tolerance of +10 to -5 percent to obtain upper and lower limits for the tolerance. The compliance for a 70/70 restricted launch condition is evaluated at the minimum and maximum tails of the intensity curve at 5 percent of the peak intensity. Restricted launch tolerances for one common fiber size, for both a 50/125 micron and a 62.5/125 micron fiber, are shown in tables II and III, respectively.
- c. Multimode 100/140 fiber size. Launch condition shall be a restricted launch as specified in table IV.

TABLE II. 70/70 restricted launch tolerances for one common 50/125 micron fiber size with an NA of 0.20.

Pattern type	Intensity level (from peak value)	Minimum tolerance	Maximum tolerance	Measurement procedure
Far field	5 %	0.13	0.16	EIA/TIA-455-47
Near field	5 %	32.5	40.0	TIA/EIA-455-43

TABLE III. 70/70 restricted launch tolerances for one common 62.5/125 micron fiber size with an NA of 0.275.

Pattern type	Intensity level (from peak value)	Minimum tolerance	Maximum tolerance	Measurement procedure
Far field	5 %	0.18	0.22	EIA/TIA-455-47
Near field	5 %	40.6	50.0	TIA/EIA-455-43

TABLE IV. Restricted launch tolerances for 100/140 micron fiber size with an NA of 0.29.

Pattern type	Intensity level (from peak value)	Minimum tolerance	Maximum tolerance	Measurement procedure
Far field <u>1/</u>	5 %	0.245	0.255	EIA/TIA-455-47
	15 %	0.210	0.225	
	75 %	0.100	0.120	
Near field <u>2/</u>	5 %	80	95	TIA/EIA-455-43
	15 %	70	85	
	75 %	30	45	

NOTE 1: Far field skewing. The difference in the angle at the 5 percentage points is not to exceed 3° when the far field intensity scan is performed in two, 90° radial orientations of the optical fiber.

NOTE 2: Near field core eccentricity. The difference in the diameter at the 5 percentage points is not to exceed 3 microns when the near field intensity scan is performed in two, 90° radial orientations of the optical fiber.

Insertion loss. The initial insertion loss and the insertion loss verification for the various fiber sizes and ferrule materials shall be as specified in table V. The insertion loss limits specified are the maximum allowed values for each measurement (each mating with respect to the pre-cut back measurement). It is not intended to average the ten matings or use other averaging schemes.

Mechanical. The following mechanical tests shall be performed in the sequence listed following the post mating durability, return loss test: mechanical shock, vibration. For single mode termini, a discontinuity is considered to be a reduction of optical transmittance of 0.5 dB or more for a duration of 50 microseconds or more (during vibration) or 100 milliseconds or more (during shock).



TABLE V. Optical insertion loss performance. 1/

Fiber Size ( $\mu\text{m}$ )	Initial insertion loss (dB)	Insertion loss verification (dB) <u>2/</u>	Ferrule material
Single mode/125 <u>3/</u>	0.75	1.25	Ceramic
50/125 <u>4/</u>	1.50	2.00	Ceramic
62.5/125 <u>4/</u>	1.00	1.50	Ceramic
62.5/125/polyimide <u>4/</u>	1.50	2.00	Ceramic
100/140	0.75	1.25	Ceramic
100/140/polyimide	1.50	2.00	Ceramic
> 100/140	1.50	2.00	Ceramic
50/125	1.50	2.00	Metal
62.5/125	1.25	1.75	Metal
62.5/125/polyimide	1.50	2.00	Metal
100/140	1.25	2.25	Metal
100/140/polyimide	1.50	2.50	Metal
200/230	1.50	2.50	Metal

- 1/ Optical loss performance based on use of specified fabrication procedure.
- 2/ Insertion loss verification is an insertion loss performed after a series of environmental tests or mechanical tests.
- 3/ Performance may be different for various single mode core sizes. Requirement shown is for 9/125  $\mu\text{m}$  fiber.
- 4/ Expected performance, when termination procedure is done for a domed ferrule with a PC polish, is 1.0 dB initial insertion loss and 1.5 dB insertion loss verification for the 50/125 fiber size and is 0.75 dB initial insertion loss and 1.25 dB insertion loss verification for the 62.5/125 fiber size. Termini used have a ferrule hole diameter of 126 +1, -0 microns.

Mechanical shock. Mated connector assemblies shall be tested in accordance with the applicable mechanical shock test listed below. Optical discontinuities shall be measured during the test. For connectors of shell sizes 17 and greater, a minimum of four termini shall be monitored for discontinuity. The change in optical transmittance shall be monitored after the test. The termini shall be visually examined after the test to the extent feasible inside the connector. Termini shall not be damaged and there shall be no loosening of parts. The requirement for optical discontinuity shall be met during the test and the requirement for the change in optical transmittance shall be met after the test. For testing, initially mate the connector assemblies and apply the specified torque value. Mark the position after the torque has been applied and check/record position after each impact. For a mating connector containing a coupling ring ratchet mechanism, do not tighten the coupling ring after each impact if the connector is being tested in addition to the terminus. Otherwise, retighten after each impact.

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- a. MIL-S-901. Mated connector assemblies shall be tested in accordance with MIL-S-901, grade A, type A, class I.
- b. Half-sine pulse. Mated connector assemblies shall be tested in accordance with EIA/TIA-455-14, test condition D. Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test sample (18 shocks).

Vibration. Mated connector assemblies shall be tested for sinusoidal vibration in accordance with the applicable vibration tests listed below. Optical discontinuities shall be measured during the test. For connectors of shell sizes 17 and greater, a minimum of four termini shall be monitored for discontinuity. The change in optical transmittance shall be monitored after the test. The termini shall be visually examined after the test to the extent feasible inside the connector. Termini shall not be damaged, and there shall be no loosening of parts, no backing off of the coupling mechanism, and no other damage which can produce physical distortion or wear and may result in fatigue of the mechanical parts. The requirement for optical discontinuity shall be met during the test and the requirement for the change in optical transmittance shall be met after the test. For testing, initially mate the connector assemblies and apply the specified torque value. Mark the position after the torque has been applied and check/record position after each axis. For a mating connector containing a coupling ring ratchet mechanism, do not tighten the coupling ring during testing.

Sine vibration in accordance with 4.5.22.2.1 of MIL-DTL-38999 (60 G).

Random vibration in accordance with 4.5.22.2.3 of MIL-DTL-38999 (41.7 G rms at an temperature of 125°C).

Random vibration in accordance with 4.5.22.2.4 of MIL-DTL-38999 (49.5 G rms at an ambient temperature).

Environmental. The following environmental tests shall be performed in the sequence listed: thermal shock, temperature life.

Thermal shock. The temperatures of -55°C +0°C, -5°C and 165°C +5°C, -0°C shall be used for the low and high soak temperatures, respectively. Mated connector assemblies shall be tested in accordance with TIA/EIA-455-71, Schedule C-0 (5 cycles). The mated connector assemblies shall not be unmated then re-mated after the test as part of the inspection. The change in optical transmittance shall be measured during (towards the end of each soak temperature) and after the test. The termini shall be visually examined after the test only if optical performance is not met. Termini shall not be damaged, and there shall be no loosening of parts, separation of bonded surfaces or other damage detrimental to the operation of the termini. The requirement for the change in optical transmittance shall be met during and after the test.

Temperature/humidity cycling. Not applicable.

Temperature cycling. Not applicable.

Temperature life. The high exposure temperature shall be  $165^{\circ}\text{C} +5/-0^{\circ}\text{C}$ . Mated connector assemblies shall be tested in accordance with TIA/EIA-455-4 for the duration of 1,000 hours at the high exposure temperature. The change in optical transmittance shall be measured after the test. The termini shall be visually examined after the test to the extent feasible inside the connector. Termini shall not be damaged, and there shall be no loosening of parts, separation of bonded surfaces or other damage detrimental to the operation of the termini. The requirement for the change in optical transmittance shall be met after the test. Performance of a cable/fiber retention test is not required as part of the final inspection for this test.

Insertion loss verification: If the cut back method is used after the mechanical or environmental tests are concluded, then return loss may be performed prior to the insertion loss verification.

Qualification connector: The qualification connector for this termini shall be a qualified MIL-DTL-38999 connector.

Qualification by similarity.

a. Qualification of termini for single mode fiber sizes.

- (1) Qualification inspection shall be performed on termini with a ferrule hole diameter of 126 microns when termini with both 125 (or 125.5) and the 126 micron ferrule hole diameters are offered. Manufacturers who qualify under this specification sheet for the 126 micron ferrule hole diameter are qualified under this specification sheet for the 125 or 125.5 micron ferrule diameter. Qualification inspection shall be performed on the 5.8/125 micron fiber size.
- (2) Constraint for qualification by similarity case listed above. This qualification by similarity case is valid if the only difference between the qualified termini (single mode 126 micron) and the smaller size termini is a change in the terminus ferrule hole diameter and TICC markings.

b. Qualification of termini for multimode fiber sizes.

- (1) Complete qualification inspection shall be performed on termini with optical fiber having a cladding diameter of 125 microns. Termini shall have a ferrule hole diameter of  $126 +1, -0$  microns. Manufacturers who qualify under this specification sheet for the terminus with the  $126 +1, -0$  micron ferrule hole diameter are qualified under this specification sheet for the other 125 cladding hole diameters for use with multimode fiber sizes.
- (2) 100/140 fiber size. Manufacturers who qualify under this specification sheet for the termini with the multimode, 50/125 or 62.5/125 micron fiber size and pass the insertion loss and size inspections are qualified under this specification sheet for the 100/140 micron fiber size. Qualification inspection for the 100/140 micron fiber size shall be performed on termini with a ferrule hole diameter of  $173 +3, -0$  microns to cover the case for terminations of termini onto polyimide coated fiber. Manufacturers who qualify under this specification sheet for the terminus with the  $173 +3/-0$  micron ferrule hole diameter are qualified under this specification sheet for the other 100/140 hole diameters for use with multimode fiber sizes (both non-polyimide and polyimide).

- (3) Multiple fiber sizes, same ferrule hole diameter. Manufacturers who qualify under this specification sheet for termini with the 50/125 micron fiber size are qualified under this specification sheet for the 62.5/125 micron fiber size. Qualification inspection shall be performed on termini with a ferrule hole diameter of 126 +1/-0 microns.
  - (4) Sizes larger than 100/140 fiber. Manufacturers who qualify under this specification sheet for the termini with the multimode, 100/140 micron fiber size or less are qualified under this specification sheet for the termini with larger fiber sizes.
  - (5) Metal ferrule sizes. Manufacturers who qualify under this specification sheet for the termini single mode and for multimode fiber sizes with ceramic ferrules and perform the full qualification inspection for the 100/140/172 fiber size using a 175 +3/-0 ferrule hole diameter and the size and insertion loss inspections for the 62.5/125/155 fiber size using the 157 +3, -0 ferrule hole diameter are qualified under this specification sheet for the other ferrule hole diameters with multimode fiber.
  - (6) Constraint for qualification by similarity cases listed above. These qualification by similarity cases are valid if the only difference between the qualified termini and the larger size termini being offered is a change in the terminus ferrule hole diameter and TICC markings.
- c. Qualification of termini for different cable strain relief capture mechanisms.
- (1) Qualification inspection shall be performed on termini for the smallest fiber size and with the largest hole diameter being offered.
  - (2) Manufacturers who qualify under this specification sheet for termini with one style of cable strain relief capture mechanism and pass the insertion loss, cable pullout, thermal shock, temperature life and a insertion and removal force verification are qualified under this specification sheet for a different cable strain relief capture mechanism. Insertion and removal verification of the termini to and from the connector shall be performed, with the termini on the ends of single fiber cable, to verify that strain relief is compatible with tools in table VII.
  - (3) Constraint for qualification by similarity case listed above. This qualification by similarity case is valid if the only difference between the qualified termini and the termini undergoing qualification is a different cable strain relief capture mechanism and TICC markings.

Cleaning prior to packaging. Termini shall be cleaned prior to packaging/shipment internally (for ensuring proper adherence of epoxy to terminus barrel (body) and ferrule and externally (for minimizing contamination).

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TABLE VII. Tools.

Tool	Part number
Insertion tool	M81969/14-03
Removal tool	M81969/14-03

Part or identifying number (PIN): See table II and paragraph 6.6 of MIL-PRF-29504.

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Basic specification  
and specification  
sheet

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TICC Code  
(see table VI)

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TABLE VI TICC numbers and "A" (ferrule hole) diameter for specified optical fiber sizes.

Fiber size (core/cladding) µm	Ferrule hole diameter µm	Ferrule material	Circular run-out µm	TICC style 1	TICC style 2	TICC style 3
Single mode/125 <u>1</u> /	125 +1/-0	Ceramic	1 <u>2</u> /	4207	4217	4265
Single mode/125 <u>1</u> /	125.5 +1/-0	Ceramic	1 <u>2</u> /	4208	4218	4266
Single mode/125 <u>1</u> /	126 +1/-0	Ceramic	1 <u>2</u> /	4209	4219	4267
50/125, 62.5/125	126 +2/-0	Ceramic	2	4210	4220	4268
50/125, 62.5/125	127 +2/-0	Ceramic	2	4040	4221	4269
62.5/125/153	156 +3/-0	Ceramic	3	4211	4222	4270
62.5/125/155	157 +3/-0	Ceramic	3	4212	4223	4271
100/140	142 +3/-0	Ceramic	4	4043	4224	4272
100/140	145 +3/-0	Ceramic	4	4044	4225	4273
100/140/172	173 +1/-0	Ceramic	2	4293	4294	4295
100/140/172	173 +3/-0	Ceramic	4	4087	4226	4274
100/140/172	175 +3/-0	Ceramic	4	4213	4227	4275
200/230	236 +4/-0	Ceramic	8	4214	4228	4276
200/280	286 +4/-0	Ceramic	8	4215	4229	4277
400/440	448 +4/-0	Ceramic	8	4216	4230	4278
50/125, 62.5/125	127 +3/-0	Metal <u>3</u> /	3		4231	
62.5/125/155	157 +3/-0	Metal <u>3</u> /	3		4232	
100/140	142 +3/-0	Metal <u>3</u> /	4		4233	
100/140/172	175 +3-0	Metal <u>3</u> /	4		4234	
200/230	236 +4/-0	Metal <u>3</u> /	8		4235	

1/ Applicable to any single mode core size. Also applicable to any multimode core size when enhanced performance is required and cladding tolerances permit.

2/ Circular run-out of 0.5 microns preferred, as it becomes more standard in industry.

3/ Termini with metal ferrules are intended for legacy systems only.

Usage: Termini compliant with this specification sheet are intended to be used in MIL-DTL-38999 connectors as applicable, may be used in connectors other than MIL-DTL-38999 at the discretion of the acquiring activity. Termini compliant with this specification may not meet all requirements of MIL-DTL-38999 if not used in a series III. Termini with metal ferrules are intended for legacy systems only.

Patent notice: The Government does not have a royalty-free license under the following patent for the benefit of manufacturers of the item, either for the Government or for use in equipment to be delivered to the Government.

<u>Patent number</u>	<u>Patent expiration date</u>
US 4,747,658	5/31/2005

Referenced documents. In addition to MIL-PRF-29504, this document references the following:

MIL-PRF-29504/5	EIA/TIA-455-14	EIA/TIA-455-47
MIL-DTL-38999	EIA/TIA-455-16	TIA/EIA-455-4
MIL-S-901	EIA/TIA-455-43	TIA/EIA-455-71

Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

CONCLUDING MATERIAL

Custodians:

Army - CR  
Navy - SH  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC

(Project 6060-0132-08)

Review activities:

Navy - AS  
Air Force - 13, 19, 93, 99  
DIA - DI  
NASA - NA

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil)