

MIL-PRF-29504/14A  
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SUPERSEDING  
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21 May 1992

PERFORMANCE SPECIFICATION SHEET

TERMINI, FIBER OPTIC, CONNECTOR, REMOVABLE, ENVIRONMENT RESISTING,  
PIN TERMINUS, FRONT RELEASE, CERAMIC FERRULE,  
(FOR MIL-C-28876 CONNECTORS)

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.

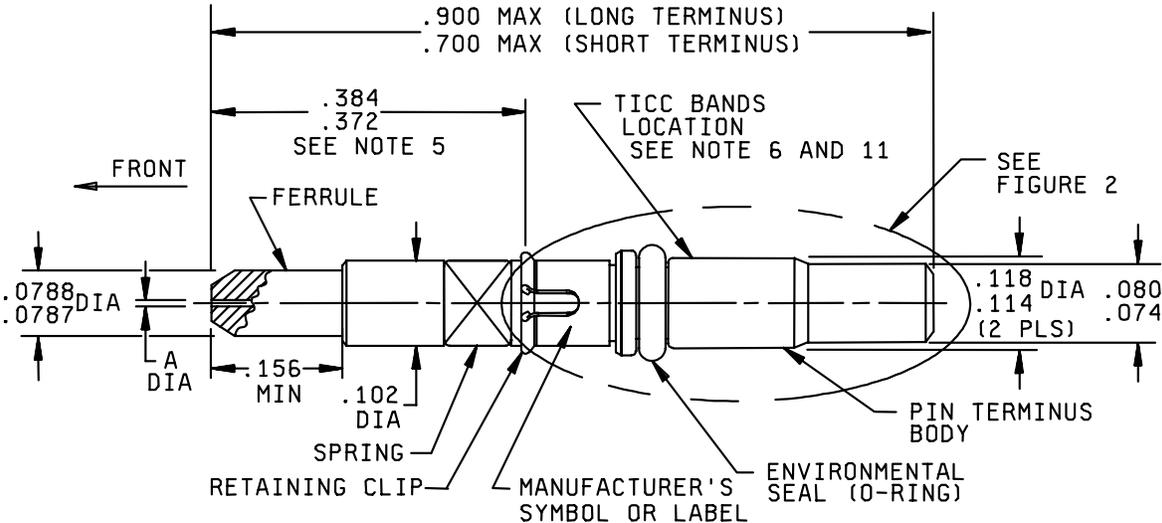


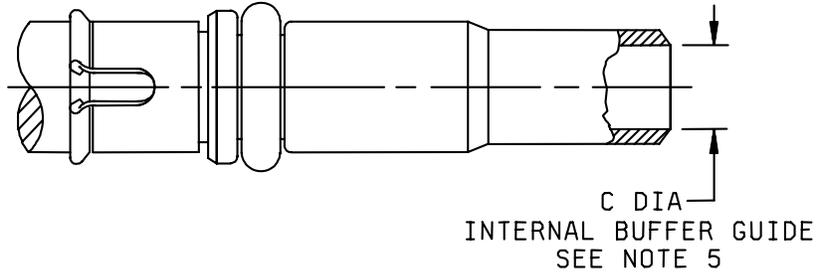
FIGURE 1. Pin terminus.

Inches	mm
.074	1.88
.0787	1.999
.0788	2.002
.080	2.03
.102	2.59
.114	2.90
.118	3.00
.156	3.96
.372	9.45
.384	9.75
.700	17.78
.900	22.86

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. All diameters are to be concentric within 0.002 inch (0.05 mm).
4. Dimensions apply after to plated /finished part.
5. Dimension .384 inch (9.75 mm) or .372 inch (9.45 mm) is to be measured when installed in connector equivalent gauge fixture and when subjected to minimal compressive force. See figure 3.
6. The TICC bands shall be at the rear of the pin terminus.
7. The .700 (17.78 mm) dimension is a maximum for the short terminus.
8. The TICC bands shall not appear on the short terminus. The individual bag or container shall have either TICC bands or the equivalent MIL-PRF-29504 Part or Identifying Number (PIN) marking on container or on a tag inside the container.
9. All terminus metal parts are to be corrosion resistant. Crimp sleeve is to be metal.
10. Terminus shown with flat end face. Radiused end faces are also permissible.
11. The dimension shown is effective prior to the application of the TICC band marking.
12. Crimp grooves are permissible on the crimp diameter.

FIGURE 1. Pin terminus - Continued.

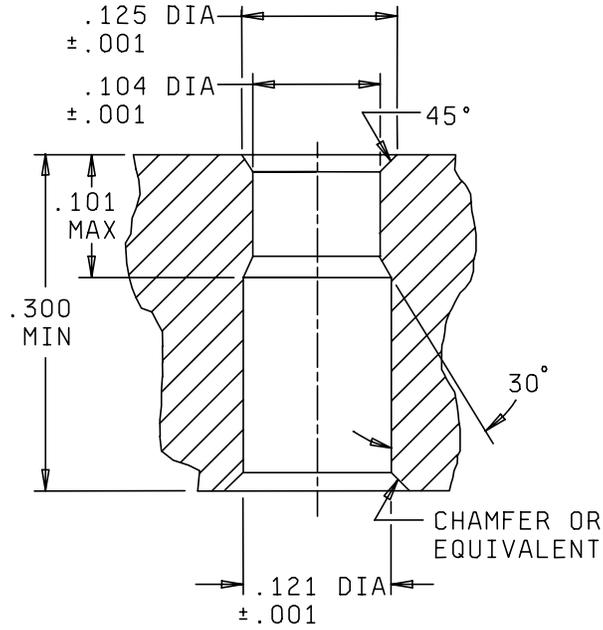


C diameter (internal buffer guide)	
Inches	mm
0.056	1.42
0.053	1.35

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. All diameters are to be concentric within .002 inch (0.05 mm).
4. Dimensions apply to plated/finished part.
5. The "C" diameter of the internal buffer guide is used to center the optical waveguide fiber buffer.

FIGURE 2. Terminus internal buffer guide.



Inches	mm
.001	0.03
.101	2.57
.104	2.64
.121	3.07
.125	3.18
.300	7.62

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. All diameters are to be concentric within .002 inch (0.05 mm).
4. Dimensions apply to plated/finished part.
5. Tolerance on all angles is  $\pm 1^\circ$ , unless otherwise noted.

FIGURE 3. Insert equivalent fixture for terminus measurement.

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REQUIREMENTS:

Temperature: -28°C to +65°C operating, -40°C to +70°C non-operating, -40°C to +70°C storage.

Design and construction:

Dimensions and configuration: See figures 1 and 2 and table I. Termini may have either flat or raduised end faces. Regardless of the end face geometry, the terminus shall meet the requirements of this specification when terminated using the procedures specified in MIL-STD-2042.

Weight: 1.0 gram maximum.

Adhesives: Use MIL-PRF-24792 or as approved by the qualifying activity.

Material:

Ferrule: Ferrule materials shall have similar performance to zirconia. Termini shall meet all of the requirements of this specification when mated to qualified socket termini utilizing a zirconia alignment sleeve and zirconia ferrule.

Tools: See table II.

Mating termini: MIL-PRF-29504/15.

Crimp sleeve: The crimp sleeve shall accept single fiber cable with a maximum outer diameter of 2.4 mm (.094 in). The terminus shall meet all requirements when the crimp sleeve is assembled to the terminus using a hex crimp die with flats measuring 2.400 mm  $\pm$  .025 mm (.0945 in  $\pm$  .001 in) across and 6.6 mm (.260 in) maximum long. Crimp sleeve is to be supplied with termini when specified in PIN.

Circular runout: The circular runout of the ferrule bore to the ferrule outer diameter shall be not greater than 1.0 micrometer.

Optical performance:

Insertion loss: The initial insertion loss of a mated pin and socket shall be not greater than 0.75 dB. The maximum insertion loss of a mated pin and socket at any time during testing shall be not greater than 1.25 dB.

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Environmental/mechanical:

Termini shall be tested to the following MIL-PRF-28876 environmental and mechanical requirements. Change in optical transmittance and optical discontinuity requirements shall be as specified in MIL-PRF-28876.

- Impact
- Vibration
- Shock
- Thermal shock
- Temperature/humidity cycling
- Temperature cycling
- Temperature life
- Flammability
- Ozone exposure

Fiber pull out force: Verification may be conducted using similarly designed MIL-PRF-29504/15 termini (from the same manufacturer) in lieu of using termini to this specification sheet

Cable pull out force: Verification may be conducted using similarly designed MIL-PRF-29504/15 termini (from the same manufacturer) in lieu of using termini to this specification sheet.

To qualify or requalify termini to this specification sheet, all requirements of MIL-PRF-28876 shall be met using the qualifying terminus in a connector qualified to MIL-PRF-28876.

Qualification connector: The qualification connector for this terminus shall be a qualified MIL-PRF-28876 connector.

Test specimens: Test specimens shall be constructed using a 62.5/125 micron optical fiber within a single fiber cable with an outer diameter not greater than 2.4 mm.

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

<u>M29504/14</u>	<u>-XXXX</u>	<u>X</u>
Basic specification and specification sheet	TICC Code (see table I)	Crimp sleeve (optional)

Qualification by similarity: Manufacturers who are qualified under this specification sheet for single-mode termini, and whose multimode termini pass the size, insertion loss, and shock inspections specified herein, are qualified under this specification sheet for multimode termini sizes. Testing is to be performed using four mated pair. This qualification by similarity is valid if the only difference between the previously qualified single-mode termini and the multimode termini is a change in the terminus ferrule dimensions.

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Manufacturers who are qualified under this specification sheet for a long terminus, and whose short termini pass the size inspections specified herein, are qualified under this specification sheet for short termini. Testing is to be performed on four terminus samples. This qualification by similarity is valid if the only difference between the previously qualified long termini and the short termini is a change in overall terminus length.

Manufacturers who are qualified under this specification sheet for multimode termini, and whose single-mode termini pass the size, identification marking, workmanship, insertion loss, return loss, cable pull out force, mating durability, shock, temperature cycling, temperature life, and flammability inspections specified herein, are qualified under this specification sheet for single-mode termini. Testing is to be performed using four mated pair. This qualification by similarity is valid if the only difference between the previously qualified multimode termini and the single-mode termini is a change in the the terminus ferrule dimensions.

Usage: Termini compliant with this specification sheet may be used in connectors other than MIL-PRF-28876 at the discretion of the acquiring activity.

TABLE 1. TICC numbers and dimensions for ferrule.

TICC number				A diameter <u>1/</u>	
Multimode (long)	Single-mode (long)	Multimode (short)	Single-mode (short)	Inches +0.00004 -0.0000	$\mu\text{m}$ <u>2/</u> +1.0 -0.0
4127	4137	4147	4157	0.00480	122.0
4128	4138	4148	4158	0.00484	123.0
4129	4139	4149	4159	0.00488	124.0
4130	4140	4150	4160	0.00492	125.0
4131	4141	4151	4161	0.00496	126.0
4132	4142	4152	4162	0.00500	127.0
4133	4143	4153	4163	0.00504	128.0
4134	4144	4154	4164	0.00551	140.0
4135	4145	4155	4165	0.00560	142.0
4136	4146	4156	4166	0.00567	144.0

1/ For maximum performance, termini should be selected for the best (tightest) fit to the fiber. Fitting the next size larger terminus to a fiber may affect connector performance.

2/ Rounded to the nearest 0.5  $\mu\text{m}$ .

TABLE II. Tools

Tool	Part number
Insertion tool	NAVSEA DWG 6872813-2 (NSN 5120-01-144-5338)
Removal tool	NAVSEA DWG 6872813-6 (NSN 5120-01-419-2942)
Polishing tool	NAVSEA DWG 6872813-18 (NSN 5120-01-419-3142)

Custodians:

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

Preparing activity:

Navy - SH

Agent:

DLA - CC

Review activities:

Navy - AS  
Air Force - 03, 13, 19, 93, 99  
NASA - NA  
DIA - DI

(Project 6060-0132-06)