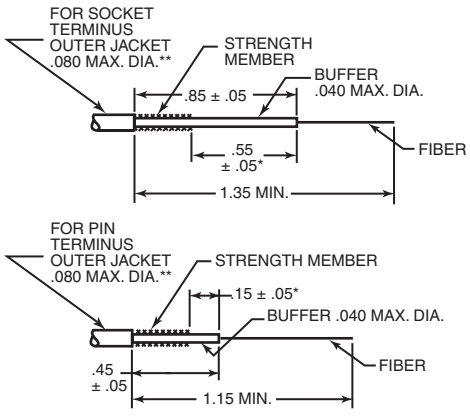
MIL-PRF-29504 Fiber Optic Termini
CF-198142-( ), CF-198143-( )
Cable Installation Instructions

WARNING NOTE:

Caution: Looking into fibers illuminated with laser light can cause eye damage. Follow safety procedures recommended by light source manufacturers.

Extreme care should be taken when handling glass fiber to avoid penetration of skin.

1. Ref. drawings CF-198142-CD and CF-198143-CD for identification and orientation of parts. Visually inspect cable for optical continuity.
2. Slide shrink tube back onto cable.
3. Strip cable to indicated dimensions.



* May be estimated if ends of strength member are frayed.
** Consult Amphenol, Sidney, NY for other O.D.s

4. Wipe off bare fiber with Isopropanol or equivalent. Fiber surface must be clean and dry before bonding.
5. (Optional) Push fiber into terminus and remove to insure proper fiber hole size.
6. Prepare epoxy per manufacturer's instructions.
   Recommended Epoxy: 200°C Max Service Temp.; #353ND
   Suggested Source:
   Epoxy Technologies, Inc.
   P.O. Box 567
   Billerica, MA 01865
7. Fill syringe with epoxy. Use 20 GA needle at least .900 long.
8. Slide the terminus, rear first, onto syringe needle. Keeping the syringe vertical, depress the plunger and slowly inject epoxy into the terminus until a small bead forms on the ferrule tip. If needle bottoms inside terminus, pull back approximately .062 while dispensing epoxy. After bead forms on ferrule tip, do not overfill. Make sure that no epoxy is on the side of the ferrule or on the spring of the socket terminus.
9. Add epoxy to outside of the rear end of terminus (.063 dia.) for approximately .150. This is to ensure bonding of the strength member to the terminus body. Carefully push stripped fiber into terminus until buffer is in contact with rear of ceramic. Outer jacket will be approximately .080 from rear of terminus. Bare fiber should be sticking out of front of terminus. Add epoxy to end of outer jacket of cable for approximately .150 to ensure sealing to shrink tube. Evenly distribute strength member over rear of contact. Bring up shrink tube to position shown in reference drawings (see step 1).
   Note: Neither shrink tube or strength members should be on .102 diameter.
10. Shrink tube using heat gun. Heat gun to be rated at 475 minimum wattage and to generate between 300°- 400°C air flow temperature. Do not apply excessive heat to F.O. cable jacketing. Epoxy at rear of terminus will turn amber color at full cure. When this happens, remove heat immediately. Repeat for other fibers.
11. To cure the epoxy at the front of the terminus between fiber and ceramic, follow either of the approved procedures listed below:

    Option 1:When using a heat gun @ 475 minimum wattage
    a. heat gun to generate between 300-400°C air flow temperature
    b. insert end of ceramic and fiber into air flow for ten 1 second intervals.

    Option 2: When using an oven - step cure per the following cure schedule:

Temp. (°C)	Ramp (minutes)	Soak (minutes)
	80	5 10
	105	5 5
	120	5 5
	150	5 5

12. Scribe glass fiber approximately .010 above ceramic. Grasp fiber and pull slightly until fiber breaks.
13. Using 15 micron lapping film, air polish the epoxy bead until a very slight brown epoxy haze remains on the ferrule.
14. Thoroughly clean termini.
15. The fully cured epoxied termini may be either hand polished or machine polished. Reference the following lists to determine which polishing fixture to use:

Table 1: Hand Polishing

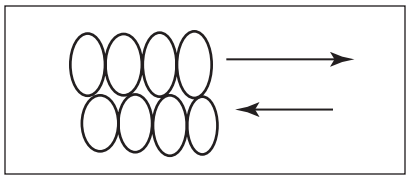
Termini P/N	Hand Polishing Fixture	Termini Capable of Polishing
CF-198142-() CF-198143-()	11-12123	1

Consult Amphenol Aerospace for recommended machine polishing procedures.

Hand Polishing

When hand polishing, follow these instructions:

16. Determine which termini are to be polished first. Use appropriate terminus holder (labeled pin or socket) on bottom polishing plate.
17. Install terminus in bottom fixture, then screw on top fixture, captivating terminus.
18. Using a 'figure 8' motion and enough pressure to overcome spring force of the polishing tool, polishing terminus on .3µ aluminum oxide lapping film backed by a 90 durometer pad. Moisten entire polishing surface of film with isopropyl alcohol when performing this step. Perform approximately 150-200 small figure 8's. Slowly work up and down the film while polishing. (see



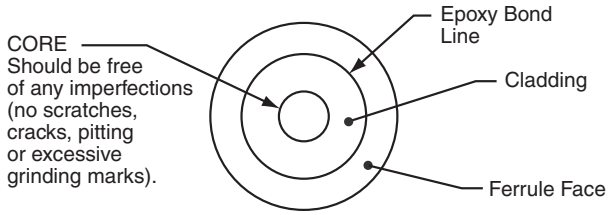
Work up and down paper while polishing

figure below).

19. Inspect end of the optical fiber for desired finish using a microscope. (See figure below).

    Note: It is recommended that an interferometer check follow

Table 1: ACCEPTABLE POLISH



hand polishing to ensure the following is met:

A) Radius of curvature: 7mm to 25mm
B) Apex offset: <50 microns
C) Fiber height for a PC (physical contact) polish protrusion: <0.05
   nanometers (nm)
D) Fiber undercut: less than or equal to .125 nanometers (nm) for a ferrule radius of curvature of 7-10mm. and decreasing exponentially to no more than 50nm for a radius of 25mm.

If fiber height (spherical) is over +0.05µ, perform in 20 sweep intervals, figure 8's on isopropyl alcohol moistened .3µ aluminum oxide film backed by a 90 durometer pad and retreat.

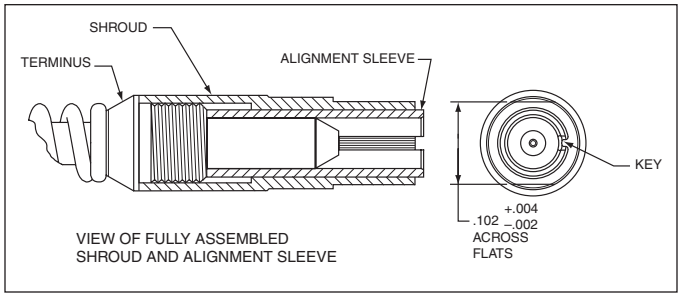
If fiber height (spherical) is below –0.05µ, perform in 20 sweep intervals, figure 8's on isoprophyl alcohol moistened 1µ silicon carbide film backed by a 90 durometer pad, then on isopropyl alcohol moistened .3µ aluminum oxide film backed by a 90 durometer pad and retest. Recommended radius of curvature is as specified above.

If undercut is too severe, polish terminus on 1µ silicon carbide film backed by a glass plate until fiber and ceramic are flat. Polish on 1µ silicon carbide film backed by a 90 durometer pad to form desired radius of curvature. Polish terminus on isopropyl alcohol moistened .3µ aluminum oxide film backed by a 90 durometer pad to produce desired finish and retest.

As a final step to reduce back reflections, add a small amount of Ultra Polishing Solution (UPS) to a .3µ aluminum oxide film backed by a 90 durometer pad. Polish terminus for approximately 10 seconds. Termini should be cleaned immediately after polishing.

20. Thoroughly clean termini and fixture. Push on protection cap, when supplied. Cap must be removed before inserting termini into connector.
21. For socket terminus ONLY:
    Thread shroud on, then align slot in alignment sleeve with key in shroud. Then push alignment sleeve until bottomed on terminus. Reference illustration below.

    Push on protection cap, when supplied. Cap must be removed before inserting termini into connector.
22. Push termini into connector until fully seated. Care should be



taken not to exceed minimum bend radius of buffered fiber. If desired, insertin tool M81969/14-03 may be used to aid assembly. For removal of termini, use extraction half of supplied tool.

Recommended Equipment
Hand Polishing

For further information consult:
Amphenol Aerospace
40-60 Delaware Ave.
Sidney, NY 13838
Phone: 607-563-5011
Website: www.amphenol-aerospace.com

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