User Manual

fibersect.multi.2®

Connector Ferrule Epoxy Cutter

PHENIX
FIBER OPTICS

Contents

Introduction

This manual is the user's guide for the Phenix Fiber Optics fibersect. multi.2® Connector Ferrule Epoxy Cutter (PNX-FS-02). Compared to the fibersect.multi, the multi.2 offers a faster, smoother cut and longer saw lifetime.

The fibersect mechanically cuts off the epoxy and fibers protruding from the face of ferrules during connector processing, prior to polishing. First pass yield and throughput are improved by eliminating hand cleaving, denubbing and minimizing the polishing steps. The resulting flat cut, at a calibrated distance from the face of the ferrule, presents the ideal starting point for polishing, improving end face geometry. The fibersect can swiftly cut the protruding fibers and epoxy for all single and multi-fiber ferrules and connectors, including 4, 8, 12, 16, 24, 32, 48 and 72-fiber MPO and MTP® ferrules. Adapters can be switched to cut either 0° (flat) or 8° (pre-angled) ferrules. Single fiber ferrule and connector adapters are also available for the LC, SC, FC, ST and others. In contrast to laser cleavers, any possibility of heat damage to the bonding epoxy and thermoplastic ferrule is eliminated.

The fibersect's small footprint, battery power, and simplicity provide exceptional mobility and ease of use on the production floor.

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Features and Benefits

- Cuts the epoxy/fibers close to the ferrule face and quickly removes the bulk of the epoxy and fibers.
- Cuts all MT ferrules including 4, 8, 16, 24, 32, 48 and 72-fiber ferrules.
- Adapters are available for both 0° (flat) and 8° (pre-angled) MT ferrules.
- Adapters are available for most single fiber ferrules and connectors.
- Cut distance from the face of the ferrule can be adjusted from 0 to >600 µm.
- Provides an ideal flat, repeatable surface to start the polishing process, improving resulting polished end face geometry.
- Eliminates the manual scoring, cleaving, and denubbing/air-polishing steps.
- Improves production throughput and first pass yield.
- Preserves ferrule length and provides tighter control over connector spring force.
- Fast, <1-4 second cut cycle.
- Simple, one button operation.
- Environmentally safe: no high intensity lasers, no noxious fumes, no fume filtering, no fire hazard.
- Power Supply: 100-240 Vac, 50-100 Hz.
- Portable: battery powered, 200 cuts per battery charge or more; small footprint.
- Dimensions: W x D x H / 3.75 x 5.23 x 2.90” / 95 x 133 x 74 mm.
- Weight: 2 lbs, 0.9 kg.

Unpacking

When unpacking the fibersect, be sure to note all included accessories and informational literature. The shipping box and packing material should be saved in case there is a need to ship or store the fibersect.

The fibersect shipment includes the following:

- Customer selected adapters
- Universal Input External AC Power Supply with international plug adapters
- Ring Adjust Tool
- Orientation Adjust Tool
- Hex Driver, 3/32” Tool
- Spare Screws
- Quick Start Guide
- User Manual

Top and Front View

Top and Front View

Power Button (1)

- To awaken the fibersect from sleep mode, press and hold the red Power Button until the Ready light turns red then release it. The light will then turn green, indicating the fibersect is now ready to use.
- The fibersect will automatically go into sleep mode if not used for 10 minutes.

READY Light (2)

- If this light is not on, it indicates that the fibersect is in sleep mode.
- A steady green light indicates the fibersect is ready to use.
- When the Power Button is pushed, the green Ready light will turn yellow, indicating that the cutting cycle is taking place.
- A flashing red light indicates that the battery voltage is too low to allow cutting. Reset the fibersect by pressing the Red Button; the light will then turn back to green. Proceed to charge the battery. The fibersect can be used normally while charging.

BATT light (3)

- A blue flashing light (once every four seconds) indicates the battery requires charging.
- A series of fast blue flashes (once per second) indicates the battery is being charged.
- A steady blue indicates the battery is fully charged when connected to the external power supply. The blue light will turn off when the fibersect is disconnected from the power source.

Caution:
Do not remove the top cover. Doing so may void the warranty.

Shipping Screw

Left Side View

Shipping Screw (4)

- The red Shipping Screw safely immobilizes the cutting mechanism during shipping.
- Unscrew the Shipping Screw prior to using the fibersect.
- Screw in the Shipping Screw prior to transporting or shipping the fibersect. Only tighten by hand; do not over tighten.

Left Side View

Adapter (5)

- The fibersect is shipped with a customer selected adapter installed.
- Adapters are available for all single and multi-fiber connectors and ferrules.

Adjusting Ring (6)

- Cutting distance from the face of the ferrule is adjusted by rotating this ring. Rotate clockwise to cut closer to the ferrule face, rotate counterclockwise to cut farther away. Each calibration mark along the perimeter represents a 25 µm increment in cutting distance.
- Use the Ring Adjust Tool to facilitate rotating the Adjusting Ring.

Caution:
Do not screw in the Adjusting Ring beyond the surface of the Adapter plate. Doing so may contact the saw and damage it.

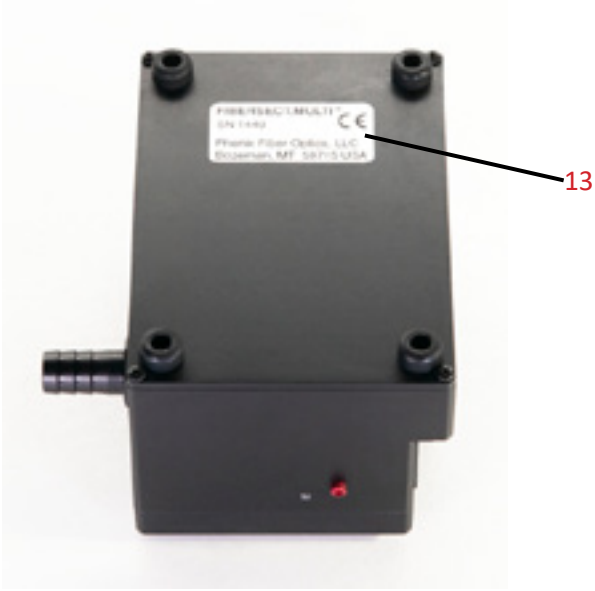
Ferrule Slot (7)

- The epoxied MT ferrule is inserted into the Ferrule Slot with its epoxy fill window facing down.
- The Arrow Icon must be pointing down with the slot horizontal prior to cutting.
- Use the Orientation Adjust Tool to rotate the slot horizontally.

Waste Bin (Non-Vacuum Models) (8)

- Collects cutting dust and debris.
- Empty waste bin contents periodically before it overflows.
- Empty waste bin contents before transporting or shipping fibersect.
- Keep fibersect upright to prevent contents from spilling internally.

Rear View



Bottom View

Rear View

Vacuum Hose Connection (9)

- The clear vacuum hose connects to this fitting for a vacuum-equipped fibersect.

Vacuum Cable Connector (10)

- This port is used to connect the gray cable for the optional remote vacuum system.
- The vacuum is turned on at the start of a cutting cycle and remains running for three seconds after the cut to fully collect cutting waste.

Power Jack (11)

- The External AC Power Supply connects here to charge the battery.
- The fibersect may be used while the battery is being charged. The fibersect will not go into the sleep mode if the External AC Power Supply is connected.

USB Port (12)

- This port is used for setup and calibration during manufacturing of the fibersect and not used by the customer.

Bottom View

SN Label (13)

- This label shows each fibersect's unique Serial Number and CE marking.

Caution:
Do not remove bottom cover. Doing so may void the warranty.

Inserting the MT Ferrule

Epoxy Fill Window Down

Arrow Icon Pointing Down

Inserting the MT Ferrule (Close Up)

Making A Cut

- If the fibersect is in sleep mode, press and hold the Power Button until the READY light turns red and then release it. The light will then turn green, indicating that it's ready to cut.
- Ensure that the MT Ferrule Slot on the adapter is horizontal with the arrow icon pointing down. For other ferrule adapter requirements, see User Information: Connector and Ferrule Adapters.
- Hold the epoxied ferrule with its epoxy fill window down and insert it into the Ferrule Slot as far as it will go. There will be some slight resistance at first; push carefully until you feel a solid stop.
- While holding the ferrule gently in place with one hand, press the Power Button to initiate the cut cycle. The READY light will turn yellow, indicating that the cut cycle is taking place.
- A very distinctive change in sound is heard while the epoxy is being cut. The end of the cut cycle will be indicated by the Ready light turning green. The cut cycle can take 1 to 4 seconds depending on the amount and hardness of the epoxy. Remove the ferrule at the end of the cut cycle.

Caution:
For best results, make sure that each fiber is completely surrounded by epoxy where the cut occurs. The epoxy can be checked with a loupe magnifier before cutting and the cut location examined after cutting. Also make sure that the epoxy is fully cured and hardened. The fiber should be fully supported by the epoxy while being cut. The epoxy provides support for the glass fiber while being cut and minimizes cut surface roughness. Fiber protrusion from the face of the ferrule before cutting should be no more than 7 mm.

It is recommended that the amount of epoxy used for MT ferrules be per US Conec AEN-1403. If a smaller amount of epoxy is used, extra care should be taken to ensure that the fibers are fully embedded in the epoxy where the cut occurs. This might require cutting very close to the ferrule face where there is more epoxy. Recommended cut length is 50-200 µm from the face of the ferrule. Do not cut through the ferrule. This will wear the saw unnecessarily and shorten its life.

Removing the Adapter Screws

Changing Adapters

The fibersect is shipped with a customer selected adapter installed. Adapters are pre-adjusted to cut at approximately 200 µm from the face of the ferrule when shipped. Once adjusted by the user, the cut length will be stable and there will be no need for further adjustments. Adapters can be quickly switched and will retain their adjustments.

Most fibersect adapters use the flange at the base of each ferrule as a reference for cut length. Actual cut length may vary slightly due to ferrule manufacturing tolerances.

Removing the Adapter

- First, remove the Waste Bin to prevent its content from accidentally spilling (Non-vacuum models only).
- Unscrew the two socket head cap screws holding the Adapter Plate in place; a hex driver tool is provided for this.
- Tilt the fibersect to allow the adapter to slip off its two guide pins

Installing the Adapter

- Orient the Adapter Plate such that the text engraving is at the top right corner. Slip the adapter on the two guide pins and secure it in place with the two socket head cap screws.

Caution:
The waste bin must be removed and emptied prior to rotating the fibersect. It should always be emptied before shipping. This will prevent its content from spilling within the housing.

Removing the Adapter exposes the saw. Never contact the saw with any object. Doing so might permanently damage it, compromising the performance of the fibersect.

Adjusting Cut Length with Ring Adjust Tool

Cut Length Adjustment

Cut length, defined as the distance of the cut measured from the face of the ferrule, can be easily adjusted over a wide range. The fibersect is shipped with the Adapter(s) adjusted to cut at about 175 µm from the face of the ferrule. A typical cut distance of 50 µm will minimize polishing while keeping a safe distance from the ferrule face. Care should be taken when shortening cut length to avoid cutting through the ferrule.

Ring Adjustment

- Turning the Adjusting Ring clockwise will cut closer to the ferrule face, counterclockwise will cut further away. Use the Ring Adjust Tool by inserting its pins into the two holes of the Adjusting Ring and rotating it. Each calibration mark around the ring indicates a 25 µm in cut length adjustment.
- Cut distance can be adjusted from 0 to 600 µm or more away from the face of the ferrule. A typical cut distance of 50 to 200 µm is recommended. Cutting close to the ferrule will minimize polishing. Cut distance adjustments should be made gradually, in controlled increments, until the desired cut distance is reached.
- Attempting to cut flush with the face of the ferrule (0 µm ditance) is not recommended as this risks cutting into the ferrule. Once adjusted, the Adapter will retain its setting when switching Adapters.

Caution:
Do not adjust the Adjusting Ring outer surface below the surface of the adapter plate. Doing so might force it against the saw and damage it. The Adjusting Ring should always be adjusted in controlled increments. Care must be taken not to cut the ferrule, as this will wear the saw prematurely.

Adjusting the Slot Horizontally with Orientation Adjust Tool

Orientation Adjustment

- The Ferrule Slot must be horizontal and the Arrow Icon pointing down when cutting. After adjusting for cut length as described above, the Ferrule Slot should be adjusted using the Orientation Adjust Tool. Insert the tool in the slot and rotate it to the horizontal position. Having the slot horizontal and arrow icon pointing down during cutting will provide a consistently uniform and parallel cut with respect to the ferrule face. This is even more important when using the 8° Angle Ferrule Adapter. Cutting distance is not affected by rotating the Ferrule Slot.
- For other single-fiber adapter orientations, see the User Information: Connector and Ferrule Adapters literature.

Caution:
It is important that the slot be adjusted horizontally prior to cutting. This is even more important when using the 8° Angle Ferrule Adapter and cutting close to the ferrule face. If the slot is not horizontal, it's possible to cut into the corners of the 8° ferrule. Accidentally cutting into the ferrule will not cause permanent damage but should be avoided. Cutting the ferrule repeatedly will wear the saw unnecessarily.

Emptying the Waste Bin

Emptying the Waste Bin

Waste Bin (Non-vacuum model only)

- Cutting debris and dust collects in the Waste Bin, which must be emptied periodically, and its contents safely disposed of. Care must be taken when moving the fibersect to keep it level so that the dust and debris are not spilled out of the waste bin. It's always safer to empty the waste bin before subjecting the fibersect to uncontrolled movements. The waste bin should always be emptied when preparing the fibersect for shipping.

Monitoring for Saw Wear

- The cut cycle time for a new fibersect will be less than 1 second. As the saw wears, the cut cycle time will gradually increase. It's recommended that the cut time be checked every 10,000 cuts.
- If the cut cycle time reaches 8-10 seconds, contact Phenix Fiber Optics, or an authorized representative, to discuss repair options.
- With proper use, the saw will last well beyond the warranty period of 200,000 cuts with significantly greater lifetime when cutting single-fiber ferrules.

Charging the Battery

The fibersect is powered by its internal battery. If used continually in production, it should be left connected to the External Power Supply to keep it charged. If running only on battery power, it will perform at least 200 cuts on a full battery charge when cutting large beads of epoxy. Actual number of cuts depends on the volume of epoxy cut and its hardness. When using a smaller amount of epoxy, as when cutting single-fiber ferrules, the number of cuts per battery charge will increase significantly.

A low battery is indicated by a blue flashing BATT light, once every four seconds. The battery should be charged at this time. Charge by plugging the External Power Supply into an AC outlet and its output plug into the rear wall jack of the fibersect. The External Power Supply comes with a set of universal outlet adapters for use with 100 to 240 Vac and 50 to 60 Hz. When charging, the BATT light flashes once per second. Full charge will take less than 5 hours and will be indicated by a steady blue BATT light. The fibersect will not go into sleep mode when connected to the External Power Supply. The blue BATT light will turn off when the external Power Supply is disconnected.

If the battery is not charged when indicated and is depleted further, the fibersect will eventually shut down and the READY light will flash red when attempting to cut. If this happens, reset the fibersect by depressing the Power Button, the Ready light will turn green. Connect the External Power Supply as described above to charge the battery.

Available Adapters*

Connector Adapters

Part Number	Description
PNX-AC-SC	SC
PNX-AC-SCA	SC/APC
PNX-AC-LC	LC
PNX-AC-LCA	LC/APC
PNX-AC-LC-D	LC-Duplex
PNX-AC-FC	FC
PNX-AC-FCA	FC/APC
PNX-AC-ST	ST (Same as PNX-AF-SC)
PNX-AC-SMA	SMA
PNX-AC-MDC	US Conec MDC®
PNX-AC-MDCJ	US Conec MDC-Junior®

Ferrule Adapters

Part Number	Description
PNX-AF-MTFC-AD	MT, 0°
PNX-AF-MTFC-AD-8	MT, 8°, Pre-angled
PNX-AF-LC	LC, Ø1.25mm
PNX-AF-SC	SC, Ø2.5mm
PNX-AF-P29504-4	M29504/4 Pin, Ø1.6mm
PNX-AF-S29504-5	M29504/5 Socket, Ø1.6mm
PNX-AF-M29504-14/15	M29504/14 & M29504/15 Pin & Socket, Ø2.0mm

*Custom adapters available upon request

Shipping Instructions

- Empty the waste bin.
- Screw in the red shipping screw to secure the fibersect against vibration and shock. Hand tighten only.
- Utilize the original shipping boxes if possible.

Limited Warranty

All Phenix Fiber Optics products are warranted against defective material and workmanship for a period of one year from the date of shipment to the original customer. Any product found to be defective within the warranty period will be repaired or replaced by Phenix Fiber Optics. The saw is warrantied for a period of one year or 200,000 cuts, whichever comes first.

The warranty does not apply to defects resulting from misuse, negligence, accident or unauthorized repairs or modifications.

Declaration of Conformity

Phenix Fiber Optics, LLC, hereby declares that this product is in conformity with the relevant requirements of:

- ROHS Directive (2011/65/EU)
- Machinery Directive (2006/42/EC)
- EMC Directive (2014/30/EU), EN 61000-6-3:2007 and 61000-6-1:2007

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