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INSTRUCTION MANUAL

DipTip™ Mini

Miniature Transmission Dip Probe

Serial No. _____

www.wpiinc.com

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ABOUT THIS MANUAL

The following symbols are used in this guide:



This symbol indicates a CAUTION. Cautions warn against actions that can cause damage to equipment. Please read these carefully.



This symbol indicates a WARNING. Warnings alert you to actions that can cause personal injury or pose a physical threat. Please read these carefully.

NOTES and TIPS contain helpful information.

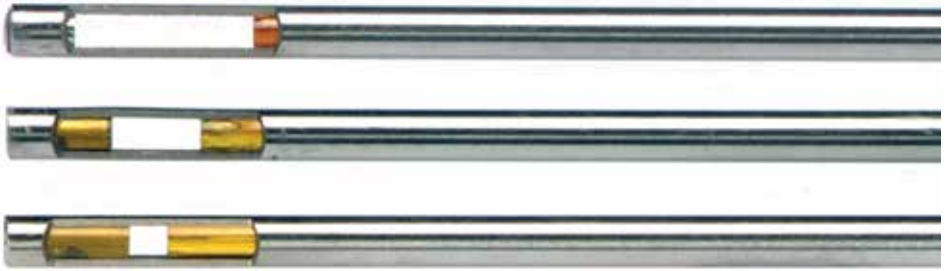


Fig. 1—The DipTips come in three pathlengths, 10mm, 5mm and 2mm.

INTRODUCTION

DipTip™ Mini is a miniature transmission probe for microliter spectroscopic sampling. Tip diameter is only 1.5 mm—the size of a 17-gauge needle. It will fit into all micro centrifuge tubes on the market and is a useful tool for measuring protein and DNA samples. It can also be used for a dissolution system.

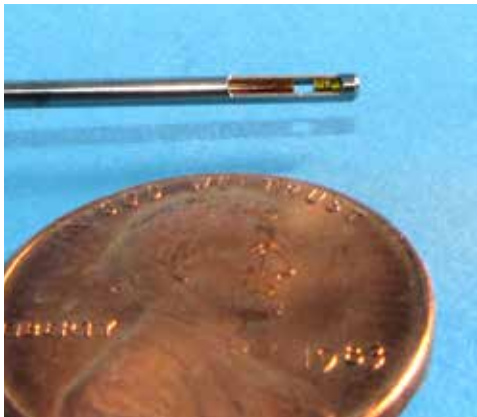


Fig. 2—This tiny shaft contains 14 fused silica fibers, all polished to a perfect tip. Light travels through seven fibers through the sample. It is reflected off a mirror in the tip and returns to the spectrometer through the sample and the other seven fibers.

Microliter samples can be analyzed cost effectively when you combine the DipTip Mini with one of the following:

- The Fiber optic-based spectrometer (**Tidas I**) and a light source (**D4H** and **FO-6000**)
- A spectrophotometer (**Tidas 100**)
- WPI's biophotometric detection system (**LEDspec**)

The DipTip Mini is ideal for multi-channel applications.

- Compatible with many standard spectrophotometers (600 μ m fiber optic coupler connections)
- 2mm, 5mm and 10mm light pathlengths available
- Flexible cables

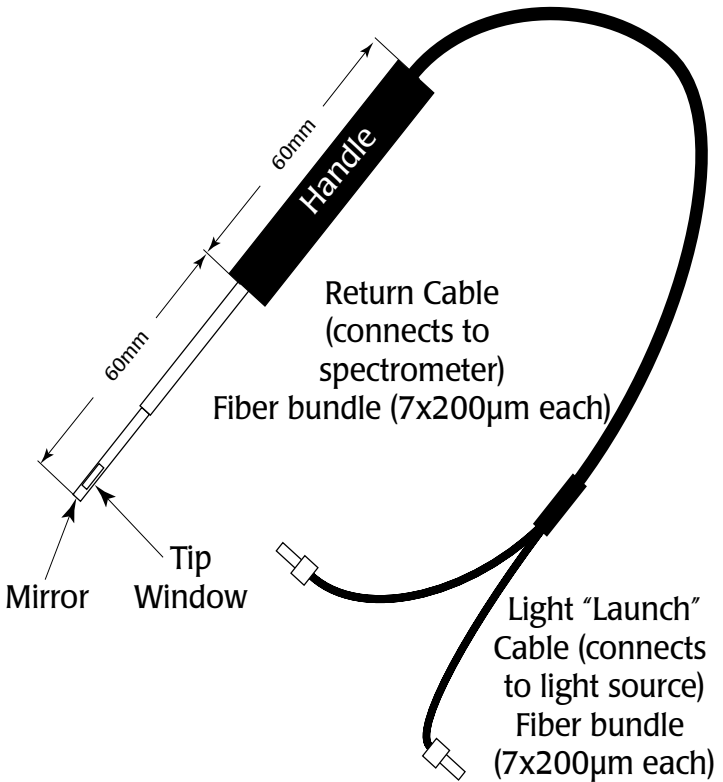


Fig. 3—Connect the fiber optic connectors to the spectrometer and the light source. Hold the Mini DipTip by the handle. Don't bend the tip.

Notes and Warnings



CAUTION: Do NOT use the DipTip Mini in hydrofluoric acid (HF) or other strong acids. HF dissolves the quartz fiber, and strong acids dissolve the stainless steel body. Avoid liquids that damage quartz or stainless steel.



CAUTION: Dropping, hitting or bumping can cause permanent damage to DipTip. The window area is fragile and the mirror can be knocked out of alignment. When DipTip Mini is not in use, always protect the tip with the plastic guard provided.



CAUTION: Always store the fiber optic connectors in protective sleeves when they are not connected.



CAUTION: Do not bend sharply or drop heavy objects on the fiber optic cable. Damaging the optical fibers causes loss of light transmission.

Parts List

After unpacking, verify that there is no visible damage to the sensor. Verify that all items are included:

(1) DipTip Mini

(1) Instruction Manual

Unpacking

Upon receipt of this instrument, make a thorough inspection of the contents and check for possible damage. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed damage should be reported at once to the carrier and an inspection requested. Please read the section entitled "Claims and Returns" on page 7 of this manual. Please contact WPI Customer Service if any parts are missing at 941.371.1003 or customerservice@wpiinc.com.

Returns: Do not return any goods to WPI without obtaining prior approval (RMA # required) and instructions from WPI's Returns Department. Goods returned (unauthorized) by collect freight may be refused. If a return shipment is necessary, use the original container, if possible. If the original container is not available, use a suitable substitute that is rigid and of adequate size. Wrap the instrument in paper or plastic surrounded with at least 100mm (four inches) of shock absorbing material. For further details, please read the section entitled "Claims and Returns" on page 7 of this manual.

Setup

Connections

Launch and return fibers connect to the light output and detector input of a fiber optic spectrophotometer such as **Tidas II** or **LEDspec**. Alternatively, you could connect the launch fiber to a light source (**FO-6000** or **D4H**) and the return fiber to a detector (WPI's **Tidas-1**, or **SpectraUSB**).

Wetting the Tip

DipTip Mini uses a mirror to return the light and it is important to keep the mirror surface clean. When stored dry, a thin film is usually deposited on the mirror by the liquid left in the tip from the previous usage. It is important to clean the tip by rinsing it in distilled water.

OPERATING INSTRUCTIONS


Taking a Reference

Since the DipTip Mini is normally used with a single beam spectrophotometer, take a reference (or blank) measurement before measuring a sample. Take the measurement while the tip is immersed in a reference solution similar to the sample solution. The reference solution should have the same:

- **Salt content**, so that its refractive index is the same
- **Concentration of buffers**, so the UV absorbency of the buffer molecule is canceled.

Taking the Measurement

To take a measurement, simply immerse the tip in a sample solution.

 **CAUTION:** It is imperative to prevent air bubbles from being trapped in the small window of the tip since bubbles can completely block the light transmission and create invalid results. A significant upward base-line shift may indicate an air bubble interfering with the light transmission.

The following steps may help eliminate bubbles:

- Insert the tip slowly and smoothly into the sample solution to allow the air to escape from the window. Repeat several times, if necessary.
- Blot the tip with a lint-free tissue such as Kimwipes and reinsert it into the solution.
- Clean the tip in detergent and thoroughly rinse it before use to relieve surface tension at the window and reduce the formation of bubbles.

MAINTENANCE

Cleaning the Tip

After sampling, remove the remaining sample from the tip with a clean wipe to reduce contamination of your cleaning solutions. The most effective method for cleaning the probe tip is to use an ultrasonic cleaning bath like the Pulsating Ultrasonic Cleaner (WPI #PUC) to remove residue that does not rinse easily. Rinse the tip of the probe in distilled water and cleaning solution (or just distilled water) between sample solutions. This helps to reduce contamination. Use safe, appropriate cleaning solutions such as distilled water, detergent, alcohol or properly diluted Cleaning Solution Concentrate (WPI #15807).

SPECIFICATIONS

Tip Diameter	1.5 mm
Light Pathlength	2, 5, 10mm
Wavelength Range (nm)	200-1000
Sample Volume Required	20-50 μ L
Distance From Tip to Upper Edge of Sample Window	7 mm
Fiber Length	1.0 m
Fiber Optic Connection	SMA 905
Launch Fibers (2) NA = 0.22	
Return Fiber (1) NA = 0.22	
Launch Fiber Bundle (7 x 200 μ m)	680 μ m*
Return Fiber Bundle (7 x 200 μ m)	680 μ m*

**Circular packaging of the fiber bundle results in an active area equivalent to a fiber with a core diameter of 680 μ m. Using a 600 μ m connection is recommended and will result in negligible light loss.*

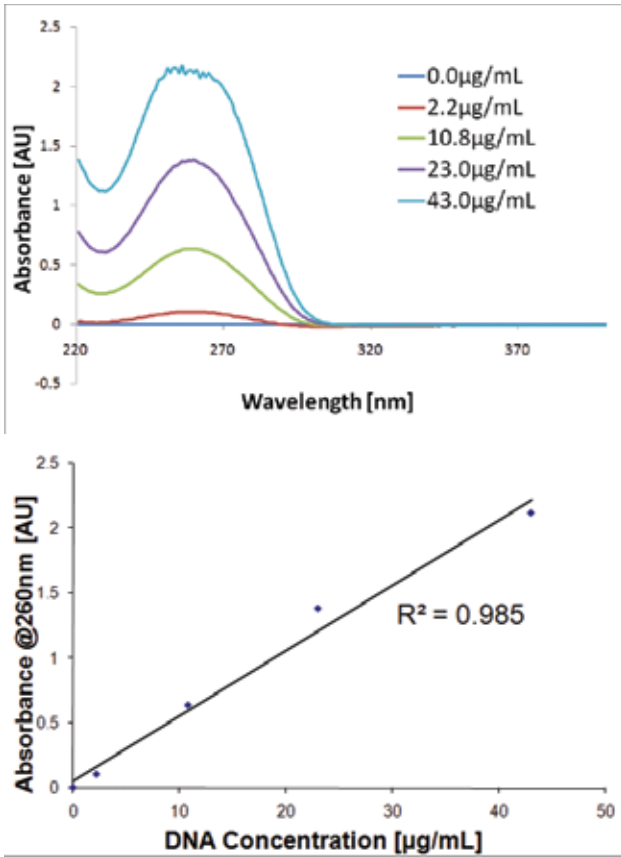


Fig. 4—DNA samples (with a sample volume of 50µL inside micro centrifuge PCR vials) were measured in PBS with concentrations 0–43µg/mL using a Tidas spectrophotometer.

WARRANTY

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of 30 days* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

Claims and Returns

Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. In some instances, photographic documentation may be required. Some items are time-sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

** Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*

USA

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