CLEANBLAST™ – BENCH-TOP

Advanced fiber end face cleaning system with FBP probe microscope

USER MANUAL

PROCESS PROCEDURES

The fiber inspection and cleaning procedures documented in this manual are recommendations made by JDSU. Please reference your company's process documents for standard tools and methods for your specific application.

ZP-PKG-0550
REV 0

JDSU

Notice

Every effort was made to ensure that the information in this document was accurate at the time of printing. However, information is subject to change without notice, and JDSU reserves the right to provide an addendum to this document with information not available at the time that this document was created.

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Patents

RibbonDrive Tips: US Patent No. 6,751,017 / 6,879,439

CleanBlast: US Patent No. 7,232.262

Tested Equipment

All pre-qualification tests were performed internally at JDSU, while all final tests were performed externally at an independent, accredited laboratory. This external testing guarantees the unerring objectivity and authoritative compliance of all test results. JDSU's Commerce and Government Entities (CAGE) code under the North Atlantic Treaty Organization (NATO) is 0L8C3.

FCC Information

Electronic test equipment is exempt from Part 15 compliance (FCC) in the United States.

European Union

Electronic test equipment is subject to the EMC Directive in the European Union. The EN61326 standard prescribes both emission and immunity requirements for laboratory, measurement, and control equipment. This unit has been tested and found to comply with the limits for a Class A digital device.

Independent Laboratory Testing

This unit has undergone extensive testing according to the European Union Directive and Standards.

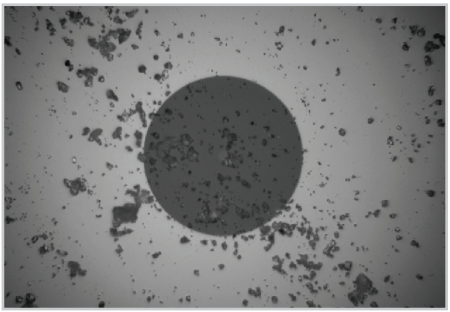
CONTENTS

INSPECT BEFORE YOU CONNECT

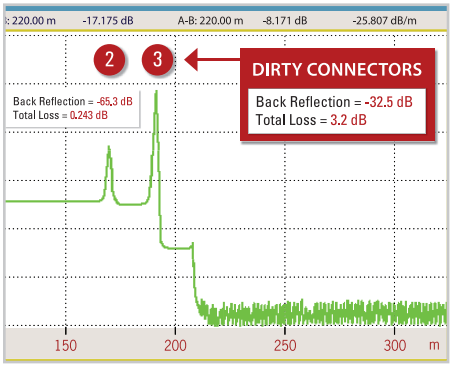
THE PROBLEM

CONTAMINATION IS THE #1 REASON FOR TROUBLESHOOTING optical networks. A single particle mated into the core of a fiber can cause significant back reflection, insertion loss, and equipment damage. Visual inspection is the only way to determine if fiber connectors are truly clean before mating them.

Dirty Fiber



OTDR Trace of Signal Loss



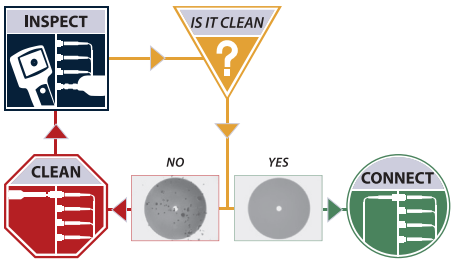
THE EQUIPMENT

JDSU's video fiber inspection probe and CleanBlast system are used to quickly and easily inspect and clean connector end faces. The FBP dual-magnification (200/400X) video probe is a handheld microscope designed for inspecting both *female* (bulkhead) and *male* (patch cord) connectors, as well as other optical devices, and the CleanBlast system provides a highly effective non-contact, solvent/pressurized air method of cleaning and removing contamination from the fiber surface quickly and efficiently.

THE SOLUTION

INSPECT *BEFORE* YOU CONNECT

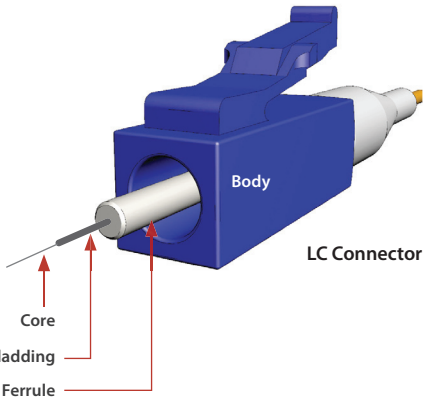
By implementing a **simple *yet* important** process of proactively inspecting and cleaning before mating, you can prevent poor signal performance and equipment damage.



FIBER OPTIC CONNECTORS

SINGLE FIBER CONNECTORS

Also called simplex connectors, these types contain a single fiber located in the center of a ceramic zirconia ferrule. The alignment of the mated connectors/fibers is achieved inside a ceramic or bronze mating sleeve within the bulkhead adapter.



Body

Houses the ferrule that secures the fiber in place; utilizes a latch and key mechanism that aligns the fiber and prevents the rotation of ferrules of two mated connectors.

Ferrule

Thin cylinder where the fiber is mounted that acts as the fiber alignment mechanism; the end of the fiber is located at the end of the ferrule.

Fiber

Cladding

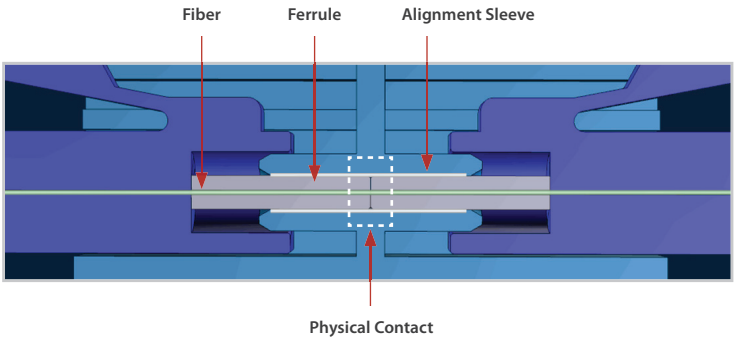
Glass layer surrounding the core that prevents the signal in the core from escaping.

Core

The critical center layer of the fiber; the conduit that light passes through.

Fiber Connection

(Simplex)

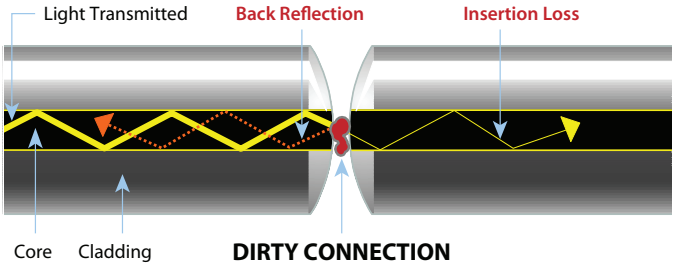


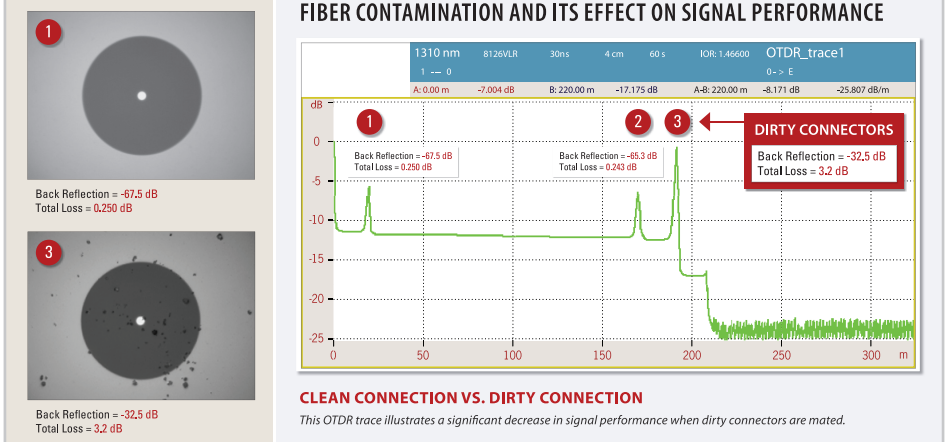
EFFECT ON SIGNAL PERFORMANCE

Dirt is everywhere, and a typical dust particle (2–15 µm in diameter) can significantly affect signal performance and cause permanent damage to the fiber end face. Most field test failures can be attributed to dirty connectors, and most of them are not inspected until the problem is detected, *after* permanent damage has already occurred.

When dirt particles get on the core surface, light becomes blocked, creating unacceptable ***insertion loss*** and ***back-reflection***. Furthermore, these contamination particles can permanently damage the glass interface by digging into the glass and leaving pits when mated, causing further signal loss. Damage also occurs when large particles of dirt on the cladding layer and/or the ferrule cause barriers that prevent physical contact, creating air gaps between the fiber connection. These large particles are also known to break apart and migrate across the fiber surface when mated.

Dirty Connection and Its Effect on Signal Performance





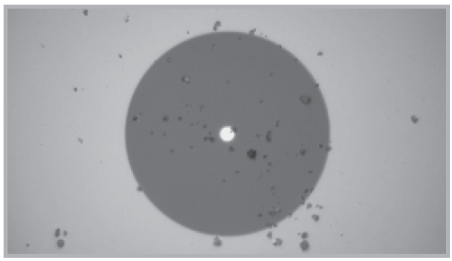
PROACTIVE VS. REACTIVE INSPECTION

PROACTIVE INSPECTION

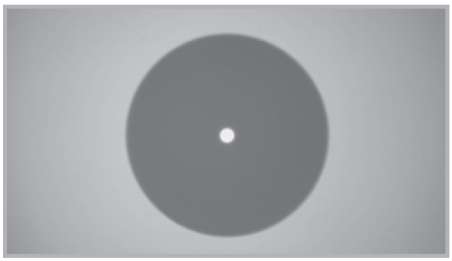
Loose debris and dirt are much easier to clean prior to mating the 2 connector sides. By visually inspecting fiber connectors at every stage of handling ***before*** mating them, you are ***proactive*** in preventing signal loss and equipment damage.

Connectors are much easier to clean prior to mating, before embedding debris into the fiber.

DIRTY FIBER
Prior to Mating



CLEANED FIBER
Before Embedding Debris

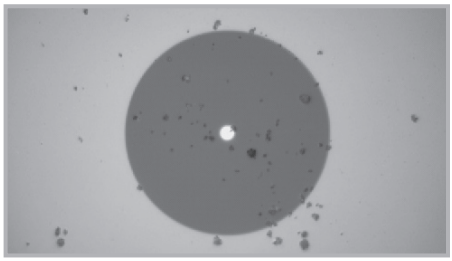


REACTIVE INSPECTION

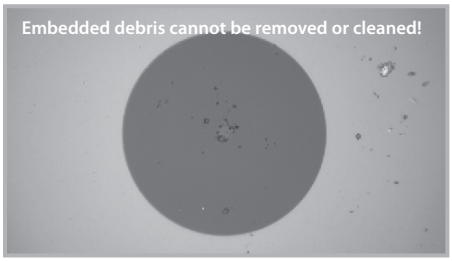
If dirty connectors are not inspected and cleaned prior to mating, dirt and debris can embed into the fiber surface causing permanent damage. By visually inspecting ***after*** a problem is discovered, typically during troubleshooting, you are taking a ***reactive*** approach.

By this time, connectors and other equipment may have suffered permanent damage.

DIRTY FIBER
Prior to Mating



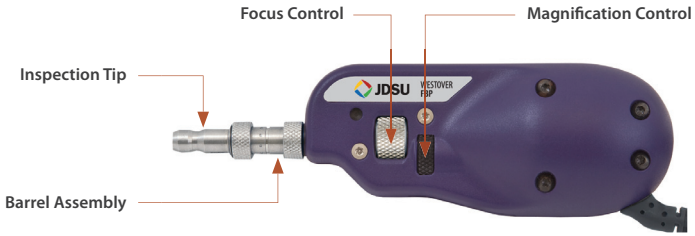
CLEANED FIBER WITH EMBEDDED DEBRIS
After Mating and Multiple Cleanings



FBP PROBE MICROSCOPE

FBP PROBE OVERVIEW

JDSU's **FBP-series** probes are portable video microscopes used to inspect fiber optic connectivity. While most fiber microscopes are limited to inspecting *male* connectors, JDSU's FBP probe is designed to inspect both simplex and multi-fiber (ribbon) types of both *male* and *female* connectors, as well as optical devices such as transceivers. The probe is specially designed to fit and operate comfortably and easily in-hand, allowing the user to inspect hard-to-reach connectors that are installed on the backside of patch panels or inside hardware devices. This eliminates the need to disassemble hardware devices prior to inspection.

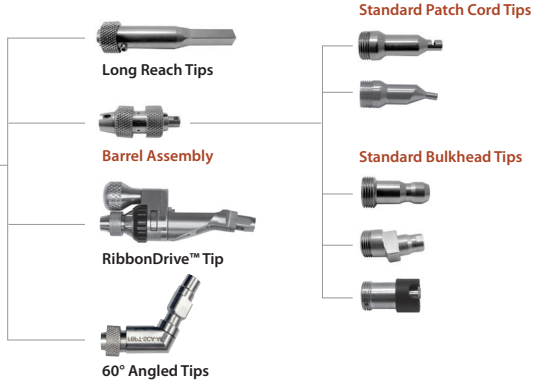


FBPT INSPECTION TIPS

JDSU's comprehensive selection* of over 250 precision, stainless-steel fiber inspection tips and adapters will inspect every connector and application. Our unique optics architecture and design provide true versatility and adaptability. These connector-specific and universal inspection tips are interchangeable, which allow the probe to interface with different types of fiber connectors.

FBPT Tip Installation Guide

** Visit our web site for a complete list of inspection tips and adapters.*



CLEANBLAST – BENCH-TOP

CLEANBLAST OVERVIEW

The patented JDSU CleanBlast fiber end face cleaning systems provide a fast, effective, and cost-efficient solution for removing dirt and debris from connectors in most common applications. CleanBlast is a non-contact system that uses a highly filtered stream of pressurized gas with a vacuum circuit to create a high flow rate jet across the surface of the fiber. A cleaning solvent is injected into the airflow, and the contamination from the end face along with the solvent are then removed through the retrieval circuit. **The precise, highly efficient non-contact *air-solvent-air* stream blasts and removes loose debris with nearly 100-percent effectiveness.**

6.4-INCH TFT LCD

6.4-INCH DISPLAY

Power Button

Press this button to power ON and OFF.
To power OFF, press and hold for 1 to 2 seconds.

Mode Button

Press this button to switch and select ***Brightness, Contrast, Color, Tint,*** and ***Reset*** modes.

Up/Down Selector

Press the ***Mode Button*** to select mode, then press this button to adjust level of image quality, e.g., brighter or darker screen, high or low contrast.

Power Cable

The terminal for power and video signal between the LCD and probe microscope. The S-video input is located on the CleanBlast panel.

6.4-INCH LCD SPECIFICATIONS

Dimensions	17.3 x 13.5 x 2.8 cm (6.8 x 5.3 x 1.1 in)
Display method	Active matrix TFT - LCD
Display size	6.4-in diagonal
Color system	NTSC/PAL (auto switchable)
Resolution	960 x 234
Operating temp	–10°C (14°F) ~ +60°C (140°F)
Storage temp	–20°C (–4°F) ~ +70°C (158°F)

Note: *Some CleanBlast systems include a 6.4-inch LCD. If included in the kit, it will be pre-installed on the system. If your unit does not include the LCD, please refer to the* ***Part and Solvents*** *section on page 29.*

OTHER CONFIGURATIONS

90° HANDSET

The 90-degree handset is a configuration that is particularly useful for cleaning termini inside Mil-Aero type connectors mounted in hard-to-reach locations. Similar to the standard handset, it features a ***safety release button*** that prevents accidental discharge of solvent or cleaning cycle.

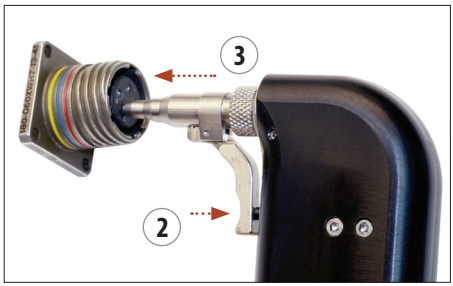
CLEANING MIL-AERO TERMINI

To clean the PIN termini:

1. Insert the tip over the termini.
2. Pull the ***safety trigger*** to depress the ***safety release button.***
3. Press the ***run button*** to initiate cleaning cycle.

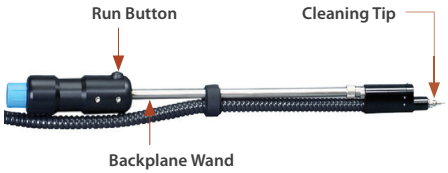
To clean the SOCKET side:

1. Seat the tip over one of the sockets.
2. Pull the ***safety trigger*** to depress the ***safety release button.***
3. Apply slight pressure and push the handset into the insert until it stops *(the **nozzle shroud** will retract and the cleaning nozzle inside the tip will advance inside the socket)*.
4. Press the ***run button*** to initiate cleaning cycle.



BACKPLANE WAND

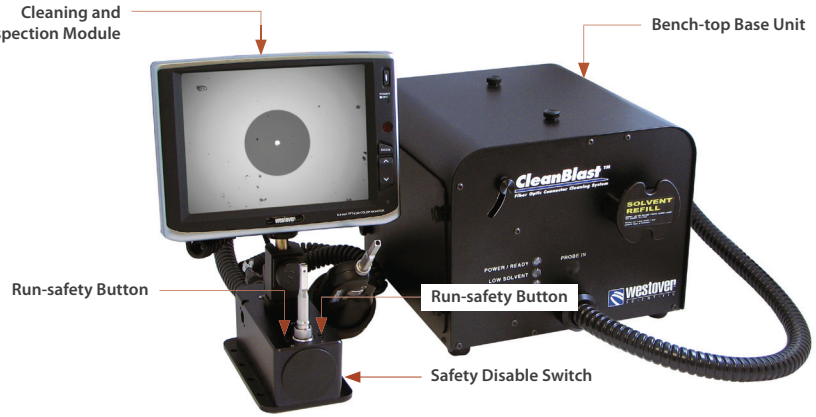
The backplane wand (FCL-MBH) is an optional configuration *(only available with FCL-B6XXX Series)* that is specifically designed to clean connectors located in the backplane.



OTHER CONFIGURATIONS

TRANSCEIVER CLEANING SYSTEM

This system is designed for both cleaning and inspection of optical transceivers. It includes the Bench-top base unit, the cleaning/inspection module, an FBP-P5 dual-magnification probe, and a 6.4-inch TFT LCD. The transceiver cleaning module is attached to the base unit via a 5-ft hose.



Run-safety Button

Two buttons operate the cleaning cycle operation and safety function. Press one button to open the safety switch and then the other button to initiate the cleaning cycle – either button will perform each function.

Note: *The safety function can be disabled by using the* ***Safety Disable Switch.*** *Move this switch from the default position to disable the safety feature.*

Warning!

The cleaning solvent is under pressure inside this system. JDSU highly recommends using the safety switch feature to prevent accidental discharge of solvent.

OTHER CONFIGURATIONS

INSPECTING TRANSCEIVERS

1. Connect the probe to the cleaning and inspection module.
2. Connect the LCD to the cleaning and inspection module.
3. Connect an inspection tip to the probe.
4. Place the transceiver onto the tip.
5. Focus the fiber image on the LCD screen by adjust the focus control on the probe.
6. Determine whether clean or dirty.

CLEANING TRANSCEIVERS

1. Complete the Bench-top system assembly.
2. Turn the power ON.
3. **Prime the system.**

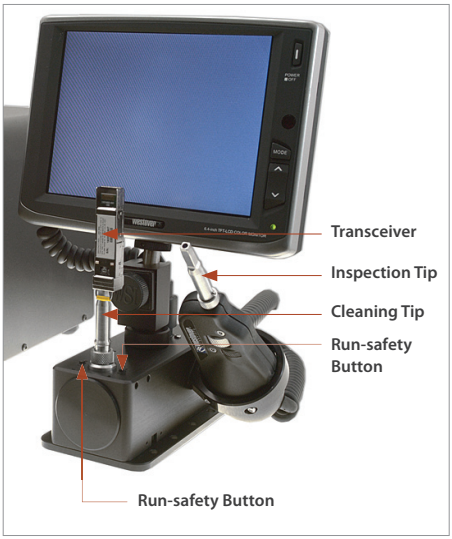
   If you are using the system for the first time, or it has been OFF for more than 4 hours, you may need to prime the tip on the cleaning module.

   a. Thread a cleaning tip onto the nut of the module.

   b. Press the safety button on the top-left side of the module. Notice the POWER/READY LED on the base unit turns green. Press the RUN button on the top-right side of the module 2–3 times.

   Note: *If you are using a tip with a smaller diameter nozzle, i.e., LC, it may be necessary to prime up to 5 times.*

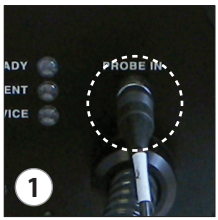
4. Place the transceiver onto the cleaning tip.
5. Push both ***safety buttons*** to initiate cleaning.



INSPECT: BULKHEAD

SET-UP

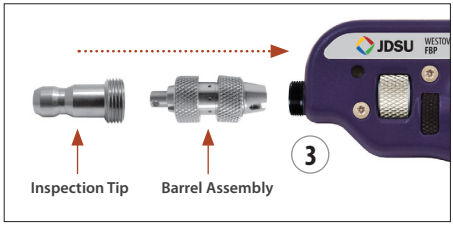
1. Connect and thread the 4-pin probe to the probe input.
2. Turn the system ON *(backside)*.



TIP INSTALLATION

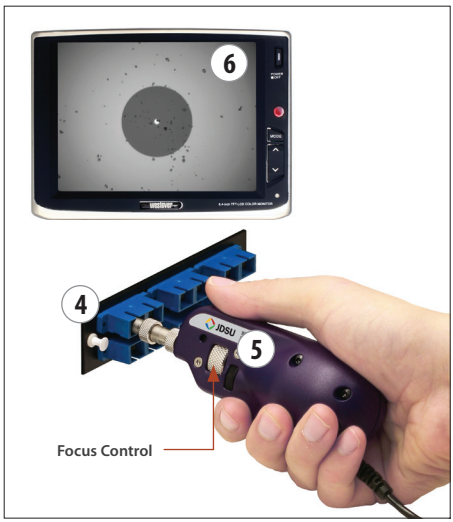
3. Install the correct **bulkhead tip** to the probe microscope.

   Note: Standard tips *require barrel assembly (see page 8 for tip installation guide and* ***Appendix A: Inspection Tips Reference Guide*** *on page 30).*



INSPECT BULKHEAD

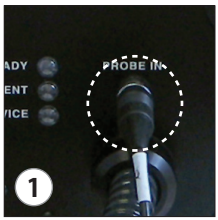
4. Insert the probe into the bulkhead to inspect.
5. Turn the ***focus control*** on the probe to focus the fiber image on the display.
6. Determine whether **clean** or **dirty**.
   - **If clean,** do not touch it and **CONNECT.**
   - **If dirty,** and if cleaning is required, **CLEAN.**



INSPECT: PATCH CORD

SET-UP

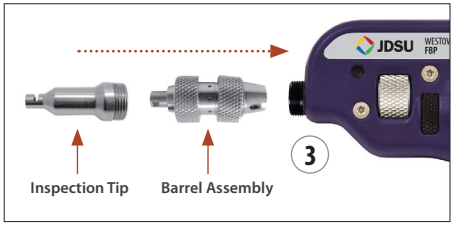
1. Connect and thread the 4-pin probe to the probe input.
2. Turn the system ON *(backside)*.



TIP INSTALLATION

3. Install the correct **patch cord tip** to the probe microscope.

   Note: Standard tips *require barrel assembly (see page 8 for tip installation guide and* ***Appendix A: Inspection Tips Reference Guide*** *on page 30).*



INSPECT PATCH CORD

4. Attach the patch cord to the probe to inspect.
5. Turn the ***focus control*** on the probe to focus the fiber image on the display.
6. Determine whether **clean** or **dirty**.
   - **If clean,** do not touch it and **CONNECT.**
   - **If dirty,** and if cleaning is required, **CLEAN.**

IS IT CLEAN?

Dirt is everywhere, and a typical dust particle (2–15 µm in diameter) can significantly affect signal performance and cause permanent damage to the fiber end face. Most field test failures can be attributed to dirty connectors, and most connectors are not inspected until the problem is detected, *after* permanent damage has already occurred.

ZONES AND ACCEPTANCE CRITERIA

Zones are a series of concentric circles that identify areas of interest on the connector end face. The inner-most zones are more sensitive to contamination than the outer zones.

Acceptance criteria are a series of failure thresholds that define contamination limits for each zone.

GRADING PROCESS

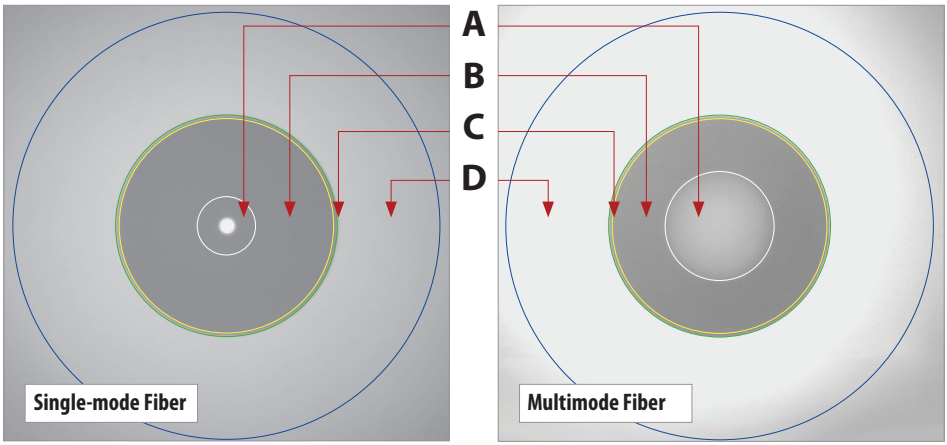
1. Count/measure the particles/contamination that are on the fiber surface.
2. Estimate or use a grading overlay to grade the fiber by determining the number and size of each particle that are present in each of the 4 fiber zones.

Note: In most cases, there are **no limits to the number/size of contamination present on **Zone C** (Adhesive/Epoxy).*

- **If acceptable,** do not touch it and **CONNECT.**
- **If not acceptable, CLEAN.**

A. Core Zone
B. Cladding Zone
C. Adhesive / Epoxy Zone*
D. Contact / Ferrule Zone

Zone Overlays



ACCEPTANCE CRITERIA

The tables below list the **acceptance criteria** standardized by the **International Electrotechnical Commission (IEC)** for single-mode and multimode connectors as documented in *IEC 61300-3-35 Ed. 1.0*.

SINGLE-MODE CONNECTORS

Zone Name	Diameter	Defects	Scratches
A. CORE Zone	0 – 25 µm	none	none
B. CLADDING Zone	25 –120 µm	no limit < 2 µm 5 from 2 – 5 µm none > 5 µm	no limit <= 3 µm none > 3 µm
C. ADHESIVE Zone	120 – 130 µm	no limit	no limit
D. CONTACT Zone	130 – 250 µm	none => 10 µm	no limit

MULTIMODE CONNECTORS

Zone Name	Diameter	Defects	Scratches
A. CORE Zone	0 – 65 µm	4 <= 5 µm none > 5 µm	no limit <= 5 µm 0 > 5 µm
B. CLADDING Zone	65 –120 µm	no limit < 2 µm 5 from 2 – 5 µm none > 5 µm	no limit <= 5 µm 0 > 5 µm
C. ADHESIVE Zone	120 – 130 µm	no limit	no limit
D. CONTACT Zone	130 – 250 µm	none => 10 µm	no limit

CLEAN: BULKHEAD

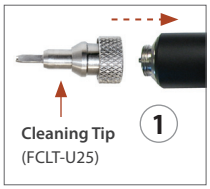
CleanBlast

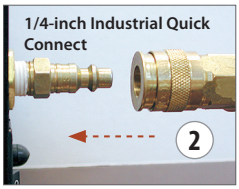
Advanced Fiber End Face Cleaning System

1. Install the appropriate cleaning tip ***(FCLT-U25 shown)*** to the CleanBlast handset.

2. Attach an external air supply *(line air or nitrogen)*.

Note: *The system requires a minimum of 60 psi and a maximum of 250 psi of clean air.*





PRIME

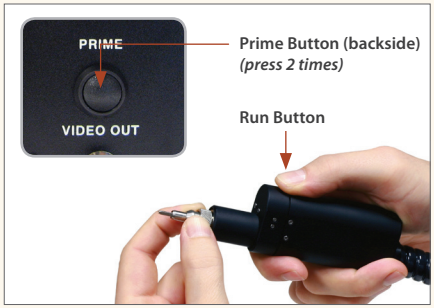
PRIME / PURGE the nozzle to clear the solvent line if you are using the system for the first time, after refill, or if the system has been powered OFF for more than 4 hours.

A. Push the ***prime button*** quickly ***2 times.***

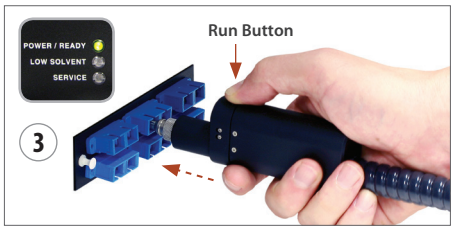
B. Aim the tip away from any surfaces or objects.

C. Press the ***run button*** on the handset.

D. **Repeat steps A through C** at least 2 more times.



3. Insert the handset into the bulkhead and push to disengage safety mechanism *(the POWER/READY light will turn green)*, and press the ***run button*** to initiate cleaning *(cleaning takes <1 second)*.



4. **INSPECT** the bulkhead.

5. Determine whether **clean** or **dirty**.

- **If clean,** do not touch it.
- **If dirty,** repeat **CLEAN.**

Note: *Embedded/mated debris cannot be cleaned, and bonded/burned debris must be physically cleaned before using CleanBlast.*

CLEAN: PATCH CORD

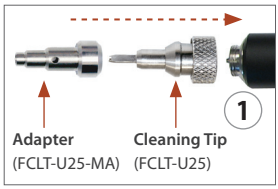
CleanBlast

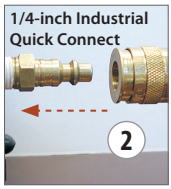
Advanced Fiber End Face Cleaning System

1. Install the appropriate cleaning tip ***(FCLT-U25 + FCLT-U25-MA shown)*** to handset.

2. Attach an external air supply *(line air or nitrogen)*.

Note: *The system requires a minimum of 60 psi and a maximum of 250 psi of clean air.*





PRIME

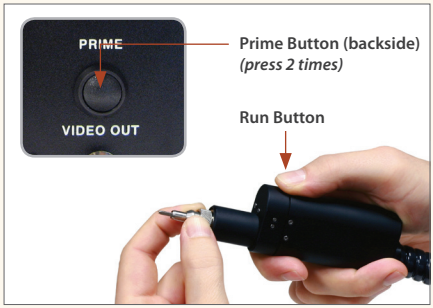
PRIME / PURGE the nozzle to clear the solvent line if you are using the system for the first time, after refill, or if the system has been powered OFF for more than 4 hours.

A. Push the ***prime button*** quickly ***2 times.***

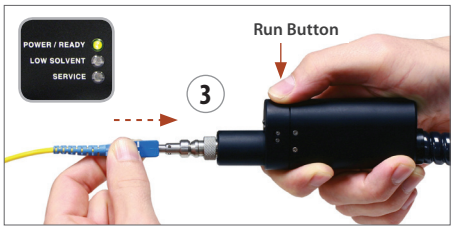
B. Aim the tip away from any surfaces or objects.

C. Press the ***run button*** on the handset.

D. **Repeat steps A through C** at least 2 more times.



3. Attach the patch cord to the handset, push the connector into the handset to disengage safety mechanism *(the POWER/READY light will turn green)*, and press the ***run button*** to initiate cleaning *(cleaning takes <1 second)*.

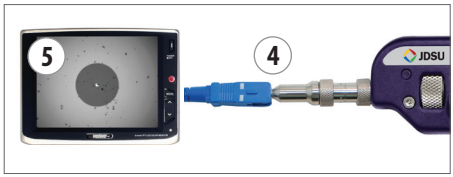


4. **INSPECT** the patch cord.

5. Determine whether **clean** or **dirty**.

- **If clean,** do not touch it.
- **If dirty,** repeat **CLEAN.**

Note: *Embedded/mated debris cannot be cleaned, and bonded/burned debris must be physically cleaned before using CleanBlast.*

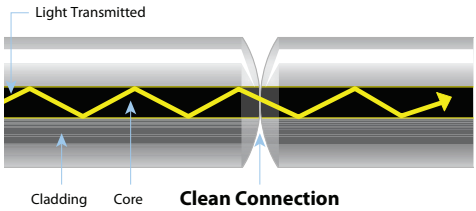


CONNECT

GOOD FIBER CONNECTION

There are **3 basic principles** that are critical to achieving an efficient fiber optic connection:

1. **Perfect Core Alignment**
2. **Physical Contact**
3. **Pristine Connector Interface**



Today's connector design and production techniques have eliminated most of the challenges to achieving **core alignment** and **physical contact.**

What remains challenging is maintaining a **pristine end face.** As a result, **CONTAMINATION is the #1 reason for troubleshooting optical networks.**

FIBER CONNECTIONS

Optical connections are made for one of two reasons:

1. **Completing a System Light Path (Tx to Rx)**

   Connectors are used extensively throughout optical networks. They give us the ability to re-configure the network and provision services. If contamination is present in the light path, system performance will be degraded.

   *Always **inspect** and, if necessary, **clean** the optical port and optical cable for contamination before connecting.*

2. **Connecting a Test Device to Part of the System**

   Test devices are frequently connected and disconnected to elements of the network. Often, test leads are systematically connected to each port in a network element in sequence. This duty cycle makes test leads especially prone to contamination and damage. If a test lead is contaminated, it can quickly spread that contamination through a large portion of the network.

   *Always **inspect** and, if necessary, **clean** the network port and test lead for contamination before connecting.*

SYSTEM STATUS INDICATORS

SYSTEM STATUS INDICATORS

POWER / READY

This dual indicator will alert the user when there is AC power connected to the system (red), and when the nozzle safety mechanism is disengaged, allowing the cleaning cycle to activate (green).

***Note:** The **run button** on the handset **will not operate when this LED is red**. To disengage the safety mechanism, apply light pressure against the bulkhead or patch cord and gently slide the handset forward. When the POWER / READY LED turns GREEN, press the RUN BUTTON on the handset to initiate cleaning.*

LOW SOLVENT

This indicator will alert the user that the level of **cleaning solvent** is too low for the system to operate and will put the system into ***standby mode.*** The solvent reservoir must be refilled before operation can resume ***(see page 22 for solvent refill procedures)***. The reservoir will hold 225 ml. (8 fl. oz.) of solvent, enough for at least 8,000 cleaning cycles.

***Note:** Do not refill the solvent reservoir if the **LOW SOLVENT** light is not illuminated. Overfilling the tank can prevent the system from pressurizing properly.*

Solvent Refill Cap Assembly

Ordering Part Number

- **FCLP-RCA-1**

Cleaning Solvent Bottle

Ordering Part Numbers

- **FCLP-SOL1** *(1 bottle)*
- **FCLP-SOL1-6** *(6 bottles)*

SERVICE

This indicator will alert the user that the system **air filters** will need to be replaced. When the **reset button** is pressed, the system cycle counter will turn to zero, and the system will count to **100,000 cycles** before alerting the next filter change ***(see page 23 for air filter change procedures).***

Air Filter

Ordering Part Number

- **FCLP-FA-F1** *(2 required per system)*

SOLVENT REFILL

Note: *Do not refill the solvent reservoir if the* ***LOW SOLVENT*** *light is not illuminated. Overfilling the tank can prevent the system from pressurizing properly.*

1. **Turn OFF** the system and disconnect the power cord from the AC power source.

2. Press the ***cap lock*** down and rotate the ***refill cap*** counter-clockwise to expose the refill ports.

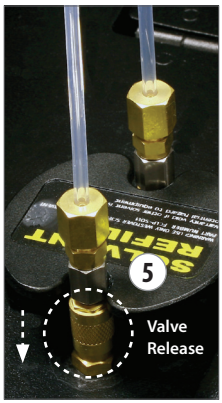
Note: *You may hear a 'hiss' of air as the tank depressurizes.*

3. Attach the ***solvent refill cap assembly*** to the ***solvent bottle***.

You must select one solvent type and use the same solvent for the lifetime of the system.

4. Push-in to attach the 2 ***quick connect valves*** to the two refill ports, and **invert - hold** the bottle until the system's cleaning solvent reservoir is full.

5. Press the ***valve release*** down to disconnect the bottle and rotate the ***refill cap*** clockwise to original position and turn the system ON.



6. **Prime** the system *(see page 18).*

MAINTENANCE SCHEDULE

Depending on the type of cleaning tip used, you should expect the following number of cleaning cycles per FULL solvent reservoir.

2.5 mm tip	9,500 cycles
1.25 mm tip	12,500 cycles
Ribbon/MTP tip	9,500 cycles

REPLACING AIR FILTERS

1. **Turn OFF** the system and disconnect the power cord from the AC power source.

2. Unscrew the 2 ***release knobs*** on the filter panel and lift up to expose the assembly.

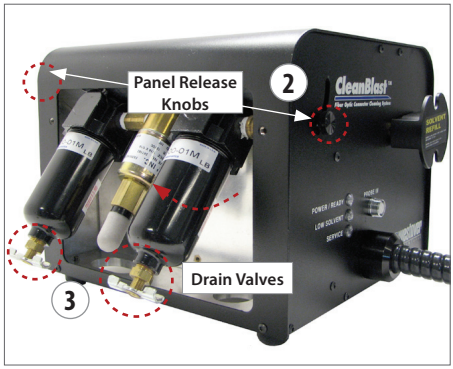
3. Loosen ***drain valves*** on 2 water trap bowls.

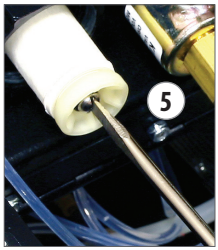
4. Unscrew & remove the 2 ***water trap bowls.***

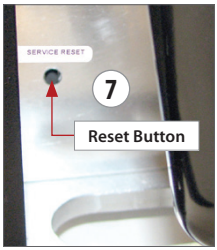
5. With a **flat head screwdriver,** unscrew and remove the 2 ***air filters,*** and replace with new filters **(FCLP-FA-F1).**

6. Replace the ***water trap bowls***, tighten the ***drain valves***, and replace the ***release knobs***.

7. With a pin or paperclip, press the ***reset button*** *(located on the interior panel behind the left water trap bowl).*







MAINTENANCE SCHEDULE

Replace the air filters once a year or every 100,000 cleaning cycles, whichever comes first.

FCLP-FA-F1	Air filter (2 required)

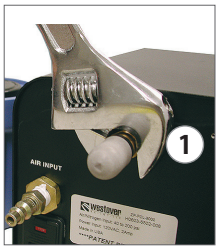
INSTALLING ACTIVATED CARBON EXHAUST FILTER *(optional)*

The optional carbon exhaust filter does an exceptional job in removing the solvent fumes from the ambient environment. Replace the exhaust filter whenever you replace the air filters: once a year or once every 100,000 cycles.

1. **Remove** the exhaust fitting from rear panel with wrench tool.

2. **Install** the ***filter cap***. Thread the **"IN"** port to the exhaust port and tighten ***(do not overtighten)***. Make sure the cap is facing up.

3. Place the ***carbon filter cartridge*** on the cap, thread, and tighten ***(do not overtighten)***.



TROUBLESHOOTING

TROUBLESHOOTING TIPS

Symptom	Potential Cause	Test / Remedy
A – Unit will not turn ON	No power to unit	• Make sure power cord is connected. • Make sure power switch is in the correct position.
B – Unit is ON, but will not fire		
Power light is blinking	***Run button*** on handset is depressed	• Turn OFF power, release ***run button,*** and turn unit ON
Power light is solid RED	Safety is not disengaged	• Apply pressure to cleaning nozzle to disable safety
Low Solvent light ON	Solvent tank is empty	• Refill the tank with cleaning solvent
C – Unit fires but no solvent is dispensed	Solvent refill cap may be open	• Close solvent refill cap
	Line may need to be PRIMED	• Prime the system *(see page 18)*
	Cleaning tip damaged or plugged	• Place the tip in electrostatic wash; if problem persists, replace tip
D – Unit operates but doesn't clean properly	No cleaning tip or wrong tip installed	• Verify correct cleaning tip and install
	Tip not fully inserted into bulkhead	• Make sure the tip comes to a stop inside mating adapter
	No solvent spray	• *See Symptom C above for remedy*
	Vacuum flow restricted	• Check exhaust port or filter for obstruction
	Air flow restricted	• Check air filters
	Nozzle damaged	• Check nozzle inside tip for damage and replace if necessary
E – Service light is ON	System at service interval	• Replace air filters *(see page 23)*
F – No image on LCD	No power to LCD	• Verify the unit and LCD power switches are ON
	No probe connected to unit	• Install probe to probe input

SAFETY INFORMATION

CLEANING SOLVENT SAFETY

Important

Given the variety of factors that can affect the use and application of this product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate this product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

HFE-based Cleaning Fluid

Intended Use: For industrial use only. Not intended for use as a medical device or drug.

Specific Use

Cleaning solvent for use in JDSU's CleanBlast systems.

Caution

Do not substitute any other cleaning solution.

Warning

Store away from heat, out of direct sunlight, away from oxidizing agents, and away from strong bases. Keep container tightly closed and in a well ventilated area. Contents may be under pressure if stored/shipped under elevated temperature. Open closure slowly to vent pressure.

Contact 3M® for the most current safety information and MSDS. Reference 3M part number ***HFE-72DA.***

First Aid Instructions

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed:

Eye Contact: Flush eyes with large amounts of water. If adverse signs/symptoms persist, get medical attention.

Skin Contact: Immediately flush skin with large amounts of water. If adverse signs/symptoms persist, get medical attention. Remove contaminated clothing and shoes and wash before reuse.

Inhalation: Move to area with fresh circulating air. If adverse signs/symptoms persist, get medical attention.

If Swallowed: Do not induce vomiting unless instructed to do so by medical personnel. Drink 2 glasses of water. Never give anything by mouth to an unconscious person. If adverse signs/symptoms persist, get medical attention.

WARRANTY INFORMATION

GENERAL INFORMATION

JDSU warrants this equipment against defects in material and workmanship for a period of 1 year from the date of original shipment. JDSU also warrants that this equipment will meet applicable specifications under normal use.

During the warranty period, JDSU will, at its sole discretion, repair, replace, or issue credit for any defective product free of charge should the equipment need to be repaired.

IMPORTANT

The warranty will become null and void if:

- The equipment has been tampered with, repaired, or worked upon by unauthorized individuals or non-JDSU personnel.
- The warranty label has been removed.
- Product enclosure screws, other than those specified in this manual, have been removed.
- The product enclosure has been opened, other than as explained in this manual.
- The equipment serial number has been altered, erased, or removed.
- The equipment has been misused, neglected, or accidentally damaged.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL JDSU BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

Liability

JDSU shall not be liable for damages resulting from the use of the purchased product, nor shall be responsible for any failure in the performance of other items to which the purchased product is connected or the operation of any system of which the purchased product may be a part. JDSU shall not be liable for damages resulting from improper usage or unauthorized modification of the product, its accompanying accessories and software.

ORDERING INFORMATION

BENCH-TOP CLEANBLAST SYSTEMS

FCL-B1000	CleanBlast–Bench-top, analog; 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip
FCL-B1000-22	CleanBlast–Bench-top, analog; 22-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip
FCL-B1000-EU	CleanBlast–Bench-top, analog; 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip; EU power supply
FCL-B1000-UK	CleanBlast–Bench-top, analog; 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip; UK power supply
FCL-B1010	CleanBlast–Bench-top, analog; 5-ft umbilical dual-bulkhead handsets; universal 2.5 mm cleaning tip
FCL-B1100	CleanBlast–Bench-top, digital; 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip
FCL-B1100-EU	CleanBlast–Bench-top, digital; 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip; EU power supply
FCL-B1100-UK	CleanBlast–Bench-top, analog; 5-ft umbilical bulkhead handset; universal 2.5 mm cleaning tip
FCL-B2000	CleanBlast–Bench-top, analog; 5-ft umbilical 90-degree bulkhead handset; universal 2.5 mm cleaning tip
FCL-B2000-22	CleanBlast–Bench-top, analog; 22-ft umbilical 90-degree bulkhead handset; universal 2.5 mm cleaning tip
FCL-B2100	CleanBlast–Bench-top, digital; 5-ft umbilical 90-degree bulkhead handset; universal 2.5 mm cleaning tip
FCL-B2100-EU	CleanBlast–Bench-top, digital; 5-ft umbilical 90-degree bulkhead handset; universal 2.5 mm cleaning tip; EU power supply
FCL-B3000	CleanBlast–Bench-top, analog; 5-ft umbilical dual-bulkhead and patch cord handsets; universal 2.5 mm tip and adapter
FCL-B4000	CleanBlast–Bench-top, analog; bulkhead handset; patch cord module; universal 2.5 mm tip and adapter
FCL-B4000-EU	CleanBlast–Bench-top, analog; bulkhead handset; patch cord module; universal 2.5 mm tip and adapter; EU power supply
FCL-B4010-08	CleanBlast–Bench-top, analog; 8-ft umbilical bulkhead handset; dual-patch cord module; universal 2.5 mm tip and adapter
FCL-B4100	CleanBlast–Bench-top, digital; bulkhead handset; digital patch cord module; 2.5 mm adapter
FCL-B4100-EU	CleanBlast–Bench-top, digital; bulkhead handset; digital patch cord module; 2.5 mm adapter; EU power supply
FCL-B5000	CleanBlast–Bench-top, analog; bulkhead handset; transceiver module; FBP-P5 probe
FCL-B5100	CleanBlast–Bench-top, digital; bulkhead handset; transceiver module; FBP-P505 probe
FCL-B5100-EU	CleanBlast–Bench-top, digital; bulkhead handset; transceiver module; FBP-P505 probe; EU power supply
FCL-B6000	CleanBlast–Bench-top; backplane cleaning wand
FCL-B6100	CleanBlast–Bench-top, digital; backplane cleaning wand
FCL-B7112	CleanBlast–Bench-top; dual-bulkhead + transceiver module

ORDERING INFORMATION

PARTS AND SOLVENTS

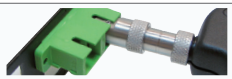
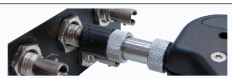
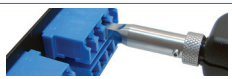
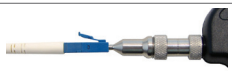
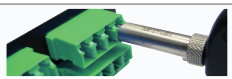
Warning!
You must select one solvent type and use the same solvent for the lifetime of the system.

VM-LCD-64B	6.4-in TFT LCD, color with mounting bracket for CleanBlast - Bench-top systems
FCL-MBH	Backplane wand (compatible only with FCL-P6100 and FCL-P102 systems)
FCLP-CH12	12-ft (3.7 m) coil hose assembly, rated 250 psi
FCLP-CH25	25-ft (7.6 m) coil hose assembly, rated 250 psi
FCLP-FA-F1	Air filter (2 required), 0.01 u, 1/8-in NPTF
FCLP-FE-01	Exhaust filter kit for CleanBlast - Bench-top systems
FCLP-FE-02	5-inch activated carbon filter refill for FCLP-FE-01
FCLP-RCA-1	Bottle cap refill assembly
FCLP-SOL1	8 oz. solvent refill bottle for CleanBlast system
FCLP-SOL1-6	Six-pack 8 oz. solvent refill bottles for CleanBlast system
FCLP-SOL2	8 oz. solvent refill bottle for CleanBlast system, 3M® HFE-71 IPA
FCLP-SOL2-6	Six-pack 8 oz. solvent refill bottles for CleanBlast system, 3M® HFE-71 IPA
FCLP-SOL3	8 oz. solvent refill bottle for CleanBlast system, FCC2, Mild
FCLP-SOL3-6	Six-pack 8 oz. solvent refill bottles for CleanBlast system, FCC2, Mild
FCLP-SOL4	8 oz. solvent refill bottle for CleanBlast system, Mild, Ionic
FCLP-SOL4-6	Six-pack 8 oz. solvent refill bottles for CleanBlast system, Mild, Ionic

APPENDIX A: INSPECTION TIPS GUIDE

INSPECTION TIPS GUIDE

B = Bulkhead P = Patch Cord

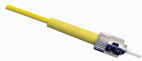
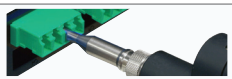
Connector Type	Inspection Tip	Application	Description
SC-UPC 	FBPT-SC (B) 		Inspect **SC-UPC** connectors through a bulkhead (barrel assembly required).
	FBPT-U25M (P) 		Inspect **2.5 mm UPC** patch cord connectors (barrel assembly required).
SC-APC 	FBPT-SC-APC (B) 		Inspect **SC-APC** connectors through a bulkhead (barrel assembly required).
	FBPT-U25MA (P) 		Inspect **2.5 mm APC** patch cord connectors (barrel assembly required).
FC-UPC 	FBPT-FC (B) 		Inspect **FC-UPC** connectors through a bulkhead (barrel assembly required).
ST-UPC 	FBPT-ST (B) 		Inspect **ST-UPC** connectors through a bulkhead (barrel assembly required).
LC-UPC 	FBPT-LC-L (B) 		Inspect **LC-UPC** connectors through a bulkhead.
	FBPT-U12M (P) 		Inspect **1.25 mm UPC** patch cord connectors (barrel assembly required).
LC-APC 	FBPT-LC-APC (B) 		Inspect **LC-APC** connectors through a bulkhead.
	FBPT-U12MA-SF (P) 		Inspect **1.25 mm APC** patch cord connectors (barrel assembly required).
MTP®-APC 	FBPT-MTPA-L (B) 		Inspect **MTP-APC** connectors through a bulkhead.
	FMA-MTPA + FBPT-UFMA (P) 		Inspect **MTP-APC** patch cord connectors.

Visit our web site for a complete list of inspection tips and adapters.

APPENDIX B: CLEANING TIPS & ADAPTERS GUIDE

CLEANING TIPS GUIDE

B = Bulkhead P = Patch Cord

Connector Type	Cleaning Tip (& Adapter)	Application	Description
SC-UPC 	FCLT-U25 (B) 		Clean **2.5 mm UPC and APC** connectors through a bulkhead.
	FCLT-U25-MA (+ FCLT-U25) (P) 		Clean **2.5 mm UPC and APC** patch cord connectors.
SC-APC 	FCLT-U25 (B) 		Clean **2.5 mm UPC and APC** connectors through a bulkhead.
	FCLT-U25-MA (+ FCLT-U25) (P) 		Clean **2.5 mm UPC and APC** patch cord connectors.
FC-UPC 	FCLT-U25 (B) 		Clean **2.5 mm UPC and APC** connectors through a bulkhead.
ST-UPC 	FCLT-U25 (B) 		Clean **2.5 mm UPC and APC** connectors through a bulkhead.
LC-UPC 	FCLT-U12 (B) 		Clean **1.25 mm UPC and APC** connectors through a bulkhead.
	FCLT-U12-MA (+ FCLT-U12) (P) 		Clean **1.25 mm UPC and APC** patch cord connectors.
LC-APC 	FCLT-U12 (B) 		Clean **1.25 mm UPC and APC** connectors through a bulkhead.
	FCLT-U12-MA (+ FCLT-U12) (P) 		Clean **1.25 mm UPC and APC** patch cord connectors.
MTP®-APC 	FCLT-MTP (B) 		Clean **MTP-UPC and APC** connectors through a bulkhead.
	FCLT-MTP-MA (+ FCLT-MTP) (P) 		Clean **MTP-UPC and APC** patch cord connectors.

Visit our web site for a complete list of cleaning tips and adapters.

Test and Measurement Regional Sales

NORTH AMERICA	LATIN AMERICA	ASIA PACIFIC	EMEA	
TEL: 1 866 228 3762	TEL: +1 954 688 5660	TEL: +852 2892 0990	TEL: +49 7121 86 2222	www.jdsu.com/inspect
FAX: 1 301 353 9216	FAX: +1 954 345 4668	FAX: +852 2892 0770	FAX: +49 7181 86 1222	

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