

STERILE TUBE FUSER - DRY

Operator Manual



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1 Introduction

1.1 Important user information

Read this before using **STERILE TUBE FUSER - DRY**



All users must read the entire *STERILE TUBE FUSER - DRY and HOT LIPS TUBE SEALER™ Operating Instructions* before installing, using or maintaining the instrument. Always keep the Operating Instructions at hand when using STERILE TUBE FUSER - DRY.

Do not operate STERILE TUBE FUSER - DRY in any other way than described in the user documentation. If you do, you may be exposed to hazards that can lead to personal injury and you may cause damage to the equipment.

Intended use

STERILE TUBE FUSER - DRY is an automated instrument designed to produce sterile joints of thermoplastic tubings.

STERILE TUBE FUSER - DRY shall not be used in any clinical procedures, or for diagnostic purposes.

Safety notices

This user documentation contains WARNINGS, CAUTIONS and NOTICES concerning the safe use of the product. See definitions below.

1 Introduction

1.1 Important user information

Warnings



WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. It is important not to proceed until all stated conditions are met and clearly understood.

Cautions



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. It is important not to proceed until all stated conditions are met and clearly understood.

Notices



NOTICE

NOTICE indicates instructions that must be followed to avoid damage to the product or other equipment.

Notes and tips

Note: A Note is used to indicate information that is important for trouble-free and optimal use of the product.

Tip: A tip contains useful information that can improve or optimize your procedures.

Typographical conventions

Software items are identified in the text by ***bold italic*** text. A colon separates menu levels, thus ***File:Open*** refers to the ***Open*** command in the ***File*** menu. Hardware items are identified in the text by **bold** text (e.g., **Power** switch).

1.2 Regulatory information

This section lists the directives and standards that are fulfilled by STERILE TUBE FUSER - DRY.

Manufacturing information

The table below summarizes the required manufacturing information. For further information, see the EC Declaration of Conformity document.

Requirement	Content
Name and address of manufacturer	GE Healthcare Bio-Sciences AB, Björkgatan 30, SE 751 84 Uppsala, Sweden

International standards

Standard	Description	Notes
EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 no. 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use	EN harmonized with 2006/95/EC
EN 61326-1	EMC emissions and immunity requirements for measurement, control and laboratory use	Harmonized with 2004/108/EC
EN ISO 12100:2010	Safety of machinery. General principles for design. Risk assessment and risk reduction.	Harmonized with 2006/42/EC

CE conformity

Directive	Title
2006/42/EC	Machinery Directive (MD)
2006/95/EC	Low Voltage Directive (LVD)
2004/108/EC	ElectroMagnetic Compatibility (EMC) Directive

CE marking



The CE marking and the corresponding Declaration of Conformity is valid for the instrument when it is:

- used as a stand-alone unit, or
- connected to other CE-marked instruments, or
- connected to other products recommended or described in the user documentation, and
- used in the same state as it was delivered from GE Healthcare, except for alterations described in the user documentation or explicitly authorized by GE Healthcare.

Regulatory compliance of connected equipment

Any equipment connected to STERILE TUBE FUSER - DRY should meet the safety requirements of EN 61010-1/IEC61010-1 or relevant harmonized standards. Within the European Union, connected equipment must be CE-marked.

Recycling



This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.

1.3 Safety precautions

All users must read this section and the Safety instructions chapter in **STERILE TUBE FUSER - DRY and HOT LIPS TUBE SEALER Operating Instructions** before using **STERILE TUBE FUSER - DRY**, and observe the safety information at all times during use.



WARNING

The end user must ensure that all installation, maintenance, operation and inspection is carried out by qualified personnel who are adequately trained, understand and adhere to local regulations and the operating instructions, and have a thorough knowledge of the entire system and process.



WARNING

Do not operate **STERILE TUBE FUSER - DRY** in any other way than described in the user documentation.



WARNING

Electrical shock hazard. All repairs should be done by service personnel authorized by GE Healthcare. Do not open any covers or replace parts unless specifically stated in the user documentation.



WARNING

Hot Surfaces of STERILE TUBE FUSER - DRY. The cutting blade reaches 400°C during the heating cycle. Do not try to open the protective cover during the welding.



WARNING

Pinch Hazard of STERILE TUBE FUSER - DRY. There are movable parts under the protective cover. Do not try to open the protective cover during the welding.



WARNING

Access to power switch and power cord. The power switch must always be easy to access. The power cord must always be easy to disconnect.



WARNING

The cutting blade of STERILE TUBE FUSER - DRY is a thin piece of alloy material. It does not have a sharpened edge but can cause cuts if handled improperly. Be sure to read and understand the procedure of how to install and remove the blade.



WARNING

Do not touch the blade of STERILE TUBE FUSER - DRY until it cools down. Always allow the blade to cool down for 30 seconds before accessing the blade.



WARNING

Depending of which tubes that are used in STERILE TUBE FUSER - DRY hazardous gases may emit. Make sure to use the instrument in a room with proper ventilation.



CAUTION

Only use tubing that is compatible with the instruments. Refer to Appendix A for a list of tubing types that have been tested.



CAUTION

Do not attempt to connect liquid-filled tubing using STERILE TUBE FUSER - DRY, or allow liquid to spill into the instrument.



CAUTION

Depending on which tubes that are used in STERILE TUBE FUSER - DRY hazardous gases may emit. Make sure to use the instrument in a room with proper ventilation.



NOTICE

Leave space around the unit for proper ventilation.



NOTICE

Only use PTFE coated cutting blades (BLADES-IR/50) specified for use with STERILE TUBE FUSER - DRY. For optimal use, do not reuse blades.



NOTICE

This is a class A product, input power > 1 kW, intended for professional use. In a domestic environment it may cause radio interference, in which case the user might be required to take appropriate measures.

1.4 STERILE TUBE FUSER - DRY

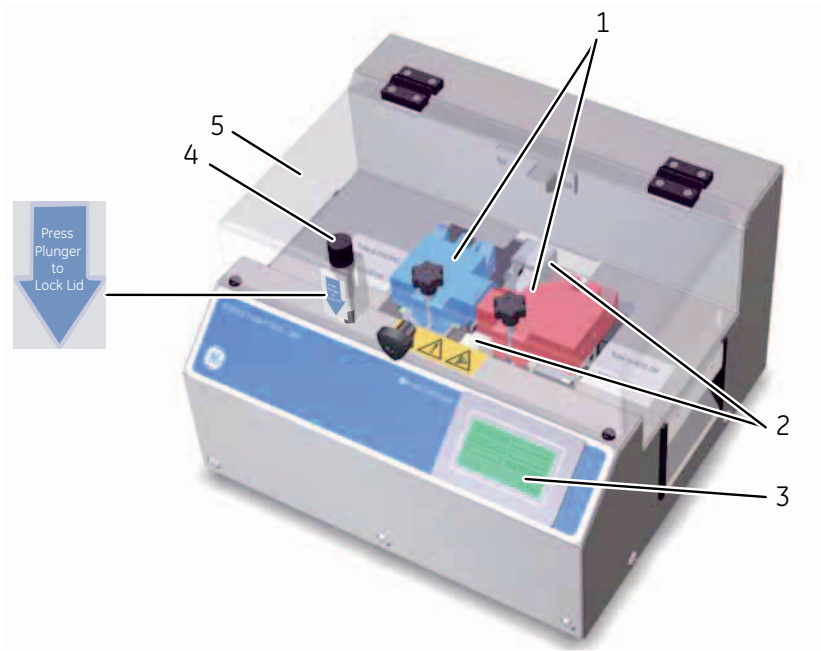
Introduction

STERILE TUBE FUSER - DRY is an automated instrument designed to produce sterile joints of thermoplastic tubings without the need for a laminar flow cabinet or similar environmental control unit. The machine is useful for connecting tubing between process containers and equipment. The unit is designed to connect large diameter tubing enabling high flow rates and large transfer volumes. Major uses are in bioprocessing and in aseptic applications.

Note: The STERILE TUBE FUSER - DRY is not to be used for medical applications.

Main parts

The illustration below shows the main parts of STERILE TUBE FUSER - DRY.



Part	Description
1	Tubing holders (blue and red)
2	Blade holders
3	Touch screen
4	COVER LOCK button
5	Cover (Lid)

Rear panel

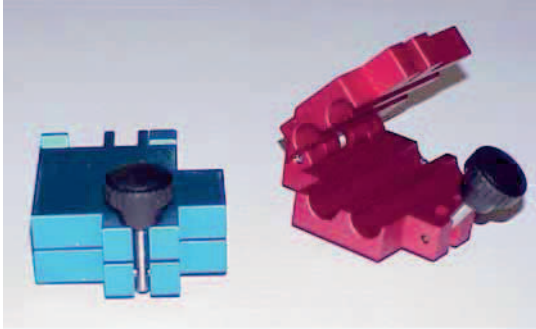
The illustration below shows the rear panel of STERILE TUBE FUSER - DRY



Part	Description
1	Ventilation fan
2	Key lock
3	Power switch
4	Data jack
5	Fuse holder
6	Power connector

Interchangeable tube holders

The image below shows the tube holders of STERILE TUBE FUSER - DRY



PTFE coated cutting blades

The image below shows the PTFE coated cutting blades of STERILE TUBE FUSER - DRY



1.5 Features

- Fully automated operation with touchpanel.
- True thermal weld provides exceptional strength.
- Aseptic connection without a laminar flow hood.
- New compact design, portable.
- Can weld different tube diameters.
- Advanced infrared non-contact sensor.
- Requires only 90 to 264 VAC, 50 to 60 Hz, 4 AMP; Universal voltage.

1.6 Disclaimer

The STERILE TUBE FUSER - DRY has been tested to produce welds of sufficient quality and strength to permit sterile transfers. It is believed to be adequate for the intended application. Under no circumstances can data in this manual be submitted to any regulatory agency in support of a clinical product without specific written permission from the manufacturer.

The manufacturer guarantees the mechanical operation of the equipment only and is not liable for any loss incurred due to the use of this equipment. Equipment must be maintained and serviced as per the recommended schedule to ensure warranty coverage.

It is the responsibility of the end user to verify and validate the suitability of this instrument for a specific application. Connections should be carefully inspected before use.

2 Principle of operation

Introduction

STERILE TUBE FUSER - DRY is used to connect two pieces of thermoplastic tubing together and produce a sterile joint. Each piece of tubing is connected on one end to a container, bag or process equipment. The other end is sealed by a clamp, plug, or other closure.

Making a sterile joint

To make a sterile joint, a new cutting blade is inserted in to the instrument each time. The blade is heated to 400°C For 10 seconds before tube cutting and welding. This ensures that the blade is sterile and depyrogenated.

Fusing procedure

Stage	Description
1	A new cutting Blade is inserted into the blade holder and it retracts into the unit. Next, the tubing is placed in the Left and Right tubing holders.
2	The COVER LOCK push button initiates the steps in the cutting and welding program. The cutting blade is heated to 400°C and held there for 10 seconds. This ensures that the blade is sterile and depyrogenated.
3	The blade is allowed to cool to a preset temperature depending on the type of tubing to be connected. This temperature is set between 190°C and 270°C depending on the tubing type and diameter.
4	The heated blade is then moved so that it melts through the two tubing pieces simultaneously. During this operation, the blade temperature is controlled, and the tubing is forced against both sides of the blade to maintain a sterile operation.
5	Once the tubing has been cut, the instrument slides the cut tubing pieces into alignment.
6	The blade is then extracted while the tubing is pushed together. The tubing pieces remain at all times in contact with the hot (190°C to 270°C) blade ensuring sterile operation.
7	Once the blade is fully extracted, the weld is allowed to cool.

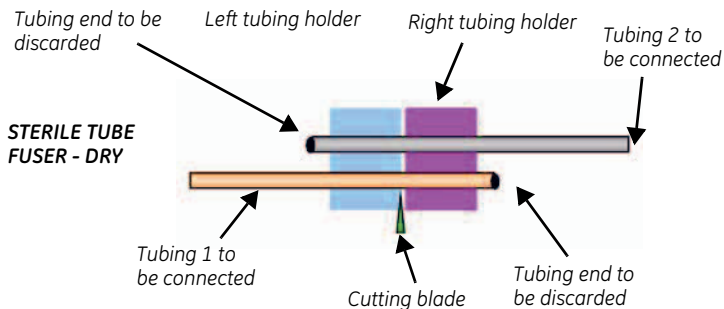
Stage	Description
8	The lid interlock is released when the weld is complete, and the machine can be opened.
9	The connected tubing can then be removed and the STERILE TUBE FUSER - DRY is ready for immediate reuse.
10	The used blade and cut tubing ends are discarded.

Reproducible procedure

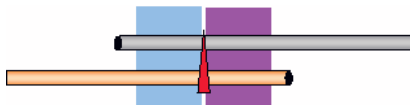
The STERILE TUBE FUSER - DRY is a fully automated instrument, and will only indicate the successful completion of the welding cycle if all operations have functioned properly. The procedure is completely reproducible and independent of operator skill. Therefore, it can be readily validated to assure a sterile joint. Use of a new disposable blade for each cycle eliminates any potential cross-contamination concerns.

2.1 Operating schematic

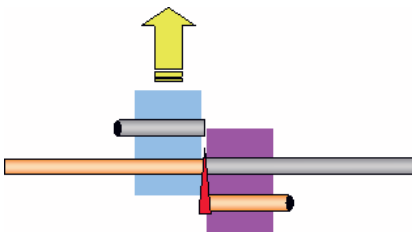
- 1 Blade is installed and it retracts into the unit. Next, the tubing is placed in the holders.



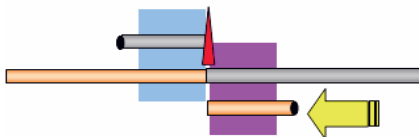
- 2 Blade heats up and then cuts through both tubing pieces.



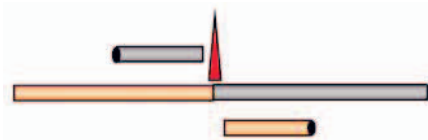
- 3 Tubing holders slide the cut tubing into alignment. Hot blade is held against the cut tubing to ensure sterility.



- 4 The blade returns to the start position and the tubing is simultaneously pushed together to form the connection.



- 5 Discard the used blade and cut tubing ends. Remove the connected tubing.



2 Principle of operation

2.1 Operating schematic

3 Operation

Precautions



WARNING

The end user must ensure that all installation, maintenance, operation and inspection is carried out by qualified personnel who are adequately trained, understand and adhere to local regulations and the operating instructions, and have a thorough knowledge of the entire system and process.



WARNING

Hot Surfaces of STERILE TUBE FUSER - DRY. The cutting blade reaches 400°C during the heating cycle. Do not try to open the protective cover during the welding.



WARNING

Electrical shock hazard. All repairs should be done by service personnel authorized by GE Healthcare. Do not open any covers or replace parts unless specifically stated in the user documentation.



WARNING

Access to power switch and power cord. The power switch must always be easy to access. The power cord must always be easy to disconnect.



CAUTION

Only use tubing that is compatible with the instruments. Refer to Appendix A for a list of tubing types that have been tested.



CAUTION

Do not attempt to connect liquid-filled tubing using STERILE TUBE FUSER - DRY, or allow liquid to spill into the instrument.



CAUTION

Depending on which tubes that are used in STERILE TUBE FUSER - DRY hazardous gases may emit. Make sure to use the instrument in a room with proper ventilation.



NOTICE

Leave space around the unit for proper ventilation.



NOTICE

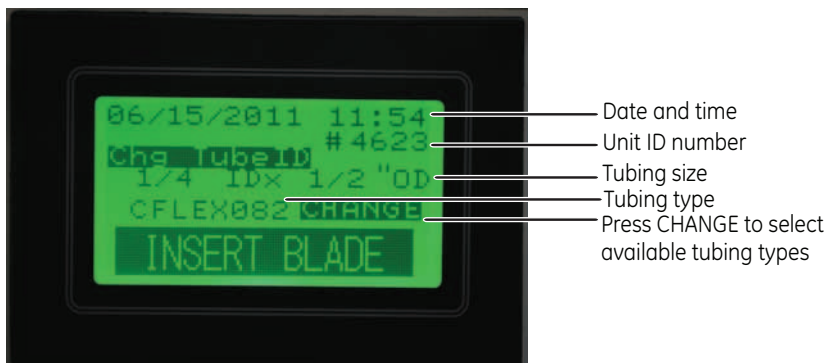
Only use PTFE coated cutting blades (BLADES-IR/50) specified for use with STERILE TUBE FUSER - DRY. For optimal use, do not reuse blades.

3.1 Controls

Normal operation is performed using the COVER LOCK button. This button ensures that the cover is locked while the mechanism is moving and also sequences the program steps. The COVER LOCK button pops out to indicate that the cover is released and can be opened.

The Touchpanel display provides the operator interface for prompts and data entry (Fig 3-1).

Fig 3-1. INSERT BLADE screen



The main power switch is located at the rear of the unit. A Key lock on the rear is used for diagnostics and program downloads. A Programming lock key is normally supplied with the unit but it is also included with a PC interface program and data cable kit from GE Healthcare.

3.2 Operating procedure

3.2.1 Main operating steps

STEP	User Action	Response
1	Switch power ON .	The display will show the version number and data revision. CLOSE COVER instruction is displayed on the screen.
2	Press the COVER LOCK button to close the cover.	The unit will initialize and test all the motors. INSTALL HOLDER instruction is displayed on the screen.
3	Open the cover and install the holder.	Display indicates the current tube settings. The tube size is based on the holder. To change the tube material press CHANGE . Select the appropriate material and press BACK to return to the main screen. The display also indicates INSERT BLADE .
4	Insert the blade using the blade Installation/Removal tool.	Display indicates BLADE INSTALLED-CLOSE COVER .
5	Close the cover. Press the COVER LOCK button.	The blade moves down. The COVER LOCK is released. Display indicates INSTALL TUBING .
6	Place the tubing firmly in the holders. The tubing ends must protrude out beyond each holder. CAUTION! Make sure that the tubing is not full of liquid by clamping upstream. Close the BLUE (left) holder first and then the RED holder.	Display indicates READY TO CUT-CLOSE COVER .

STEP	User Action	Response
7	Close the cover. Press the COVER LOCK button.	The blade will heat to the depyrogenation temperature. The display will show the temperature and hold time. Then the blade will be allowed to cool to the cutting temperature. After reaching the set cut temperature, it will move upwards, cutting through the tubing. Next, the tubing holder will move sideways to align the cut tubing and the tubing will be pushed together while the blade retracts. The blade will cool down. The the display will show a WELD# XXXX COMPLETE message. REMOVE BLADE AND TUBES is indicated in the display.
8	Remove the blade and the tubes.	The display indicates TO RESET-CLOSE COVER .

3.2.2 Safety precautions during operation



WARNING

Hot Surfaces of STERILE TUBE FUSER - DRY. The cutting blade reaches 400°C during the heating cycle. Do not try to open the protective cover during the welding.



WARNING

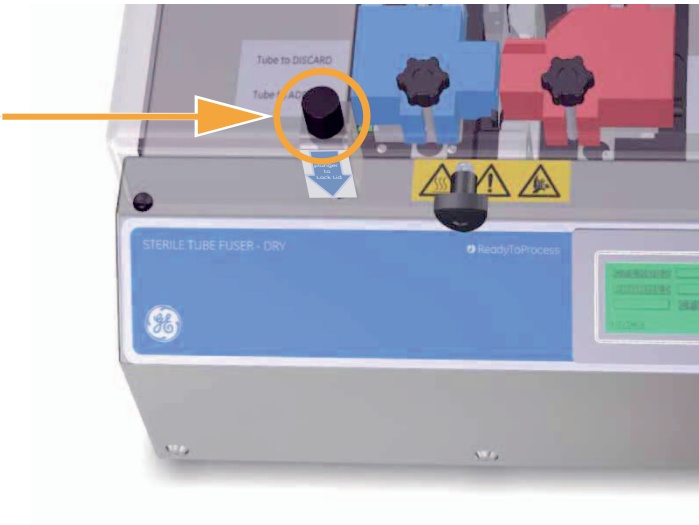
Pinch Hazard of STERILE TUBE FUSER - DRY. There are movable parts under the protective cover. Do not try to open the protective cover during the welding.

To lock the cover, press and hold the COVER LOCK button until you hear a “CLICK” (for a few seconds). Make sure that the COVER LOCK button is down during the welding and aligning operation.

Fig 3-2. COVER LOCK button down — lid is locked.



Fig 3-3. COVER LOCK button up — lid is unlocked.



3.3 Installing and removing blades



WARNING

The cutting blade of STERILE TUBE FUSER - DRY is a thin piece of alloy material. It does not have a sharpened edge but can cause cuts if handled improperly. Be sure to read and understand the procedure of how to install and remove the blade.

- 1 Place STERILE TUBE FUSER - DRY blade in Installation/Removal Tool as shown below.

Fig 3-4. Blade with the Installation/Removal tool.



- 2 Use Installation/Removal tool to install the blade by pressing the top of the tool with the palm of the hand. During blade installation, secure the blade within the tool by compressing with thumb as shown.

Fig 3-5. Side view.



3 Operation

3.3 Installing and removing blades

- 3 Press Installation/Removal Tool with palm of hand until blade is fully inserted into mounted position. Remove Installation/Removal Tool and close STERILE TUBE FUSER - DRY lid.
- 4 Removal of blade is accomplished by reversing the steps described above.

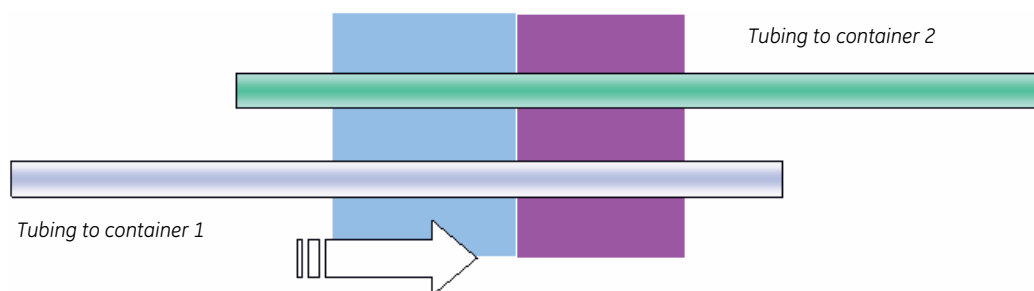


WARNING

Do not touch the blade of STERILE TUBE FUSER - DRY until it cools down. Always allow the blade to cool down for 30 seconds before accessing the blade.

3.4 Load the tubing

- 1 Clean the outside of the tubing area to be connected using a suitable disinfectant.
- 2 Place the tubing firmly in the holders. The tubing ends must protrude out beyond each holder.
- 3 Close the **BLUE** (left) holder first and slide it towards the **RED** (right) holder. Clamp it down securely.
- 4 Close the **RED** holder and tighten the clamp.
- 5 Close the cover.
- 6 Press and hold the COVER LOCK button until you hear a “CLICK” (for a few seconds) to sequence the program.



Left tubing holder

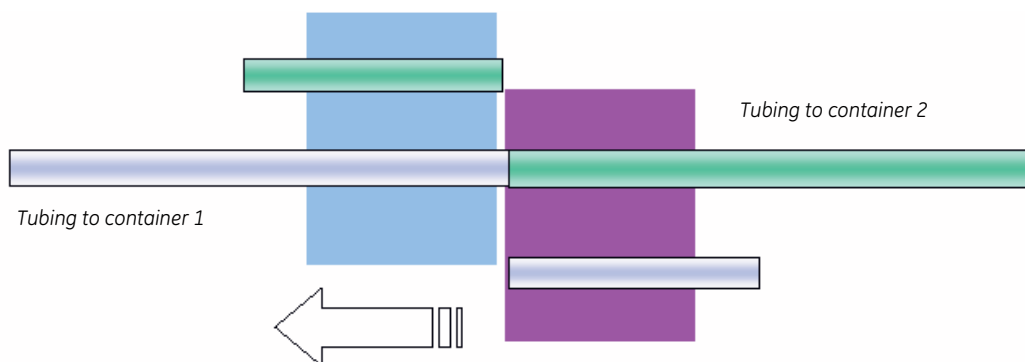
Close this first, then slide to right and clamp.

Right tubing holder

Close this next and clamp down.

3.5 Remove the tubing

- 1 First, remove the used blade and discard.
- 2 Open the **RED** holder.
- 3 Next, open the **BLUE** holder and slide it to the left to open.
- 4 Remove the tubing and discard the cut ends.
- 5 Close the cover.
- 6 Press and hold the COVER LOCK button until you hear a "CLICK" (for a few seconds) to reset the machine.



Left tubing holder

Open after the right tubing holder has been unloaded.

Right tubing holder

Open this first when unloading.

3.6 Change the tubing holders

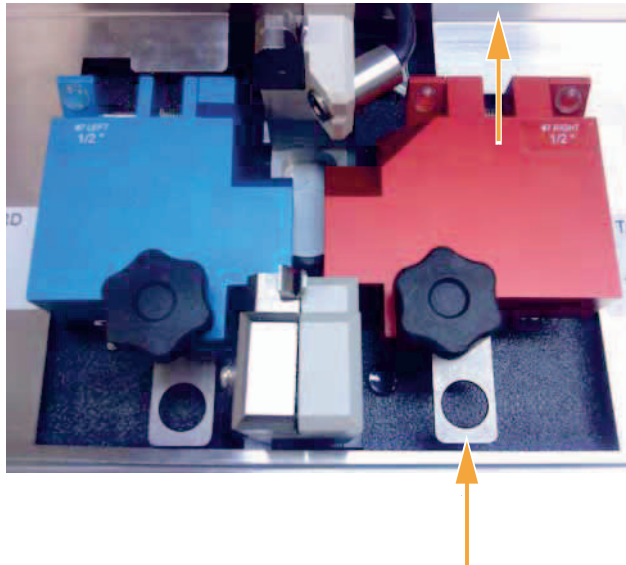
Introduction

The tubing holders can be quickly changed to connect different diameter tubing. The holders must be changed as a set (Left and Right holders).

Removing the tubing holders

- 1 Open the cover.
- 2 Locate the locking tab on the holder. Push the locking tab towards the rear of the unit to unlock the tubing holder.
- 3 Lift the holder out.
- 4 Repeat the procedure on the second holder.

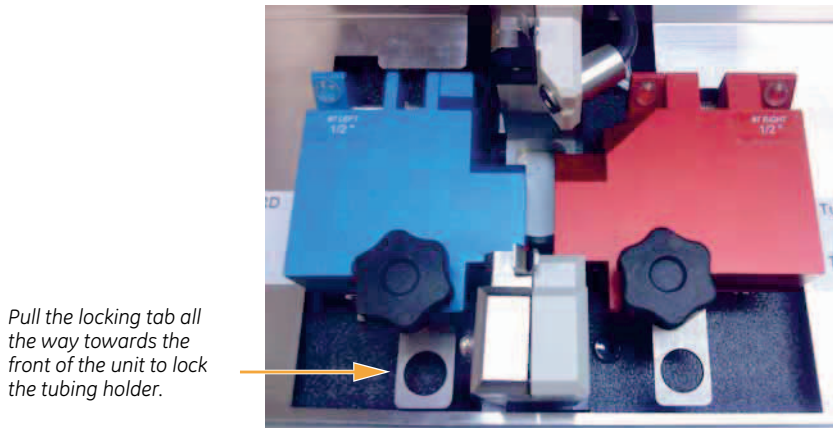
Fig 3-6. Removing the tubing holders.



Installing the tubing holders

- 1 Open the cover.
- 2 Ensure to use the correct tubing holder and set each tubing holder on its platform. *Ensure that the alignment pins under the tubing holder mate into holes in the platform.*
- 3 Pull the locking tabs towards the front of the unit to lock the tubing holders.

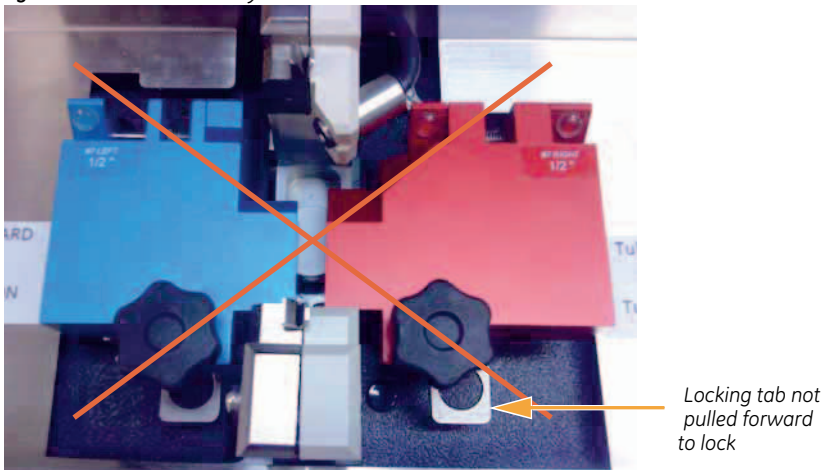
Fig 3-7. Holders *correctly* installed.



Tubing Holders are coded so that the machine automatically reads the holder type and selects the appropriate program. Insert only a mated set of holders.

Note: Before installing ensure that right & left tube holders are of same size.

Fig 3-8. Holders *incorrectly* installed.



3.7 Change the tubing type

Introduction

STERILE TUBE FUSER - DRY is pre-programmed to accept up to four tubing types. The instrument comes with factory loaded setting of 4 tube types. Only approved tubing types are displayed for each holder. Custom tubing materials and sizes can be programmed. Please contact your local GE Healthcare representative for custom programming. To replace the factory loaded tube types, refer to the *STERILE TUBE FUSER - DRY and HOT LIPS TUBE SEALER Tube Data Management Tool User Manual* (available with GUI tool).

Instructions

At the **INSERT BLADE** screen, press the **CHANGE** button. Select and press the desired tubing type on the display. If no tubing types appear on the first screen, check the second screen. Press the **NEXT** button to view the second screen and select the tubing type.

Fig 3-9. If you have already inserted the blade and wish to change the tubing type, simply remove the blade to get this selection screen. If the tubing has been installed you must remove the tubing, cycle power to the machine, and then remove the blade to get this screen.



The tubing diameter is set by the holder type and is read automatically by the machine when the holder is inserted. See Appendix A for a list of available tubing sizes.

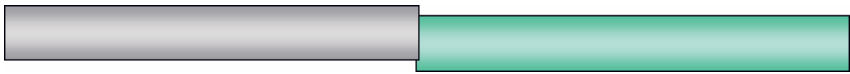
3.8 Inspecting weld quality

The STERILE TUBE FUSER - DRY is designed to make reproducible and reliable connections, however it is still critical to inspect the weld prior to use.

Note: Allow the weld to cool for 2 to 3 minutes before inspection to achieve optimal strength.

1 Axial alignment

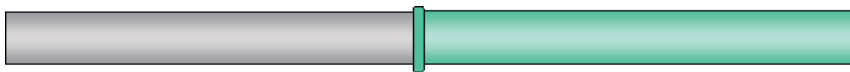
Check that the tubing is axially aligned. If the tubing is offset, then the weld will be weaker on one side. Do not use such welds. Contact the Service department to realign the unit.



2 Uniform weld

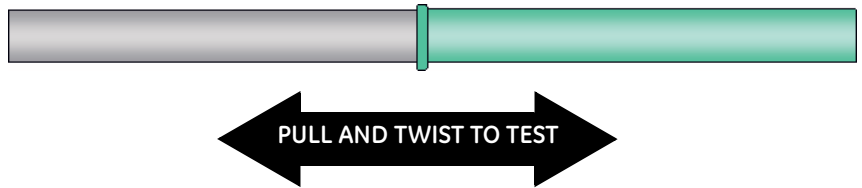
Check that you see a flange all around the weld. This indicates that the weld is uniform in the radial direction. If you do not see a flange all the way around, then discard the weld. Perform the checks described and weld again:

- Ensure correct tubings are used
- Ensure correct holders are used
- Ensure approved tubing size and formulation are used.
- Insert a new blade
- Ensure holders are closed and properly latched.



3 Good tensile strength

Pull GENTLY at the weld. It should not come apart or start to crack.



3.9 How to handle liquid filled tubing

It is not possible to weld together tubing that is filled with liquid. Before sealing, pump out the excess fluid. Stop re-enter of liquid by clamping the tubing. All clamps must be placed outside the Lid.



CAUTION

Do not attempt to connect liquid-filled tubing using STERILE TUBE FUSER - DRY, or allow liquid to spill into the instrument.

3.10 Using different types of tubing

Most thermoplastic tubing can be joined in the STERILE TUBE FUSER - DRY. It is not possible to weld together non-thermoplastic formulations such as Teflon, silicone, or natural rubber. A list of compatible tubing is provided in Appendix A.



WARNING

Depending of which tubes that are used in STERILE TUBE FUSER - DRY hazardous gases may emit. Make sure to use the instrument in a room with proper ventilation.

Your machine was set with the default tube types as shown in Appendix A. The additional tube types in that table may be programmed into the unit, but only four tube types are allowed at one time. To replace the factory-loaded tube types, refer to the *STERILE TUBE FUSER - DRY and HOT LIPS TUBE SEALER Tube Data Management Tool User Manual* (available with GUI tool).

3.11 Welding different diameters

The STERILE TUBE FUSER - DRY is capable of joining tubing of various outer diameters. Different sets of tubing holders specific to each tubing outer diameter must be purchased.

Each holder set consists of a **BLUE** (left) holder and a **RED** (right) holder. Both holders must be changed as a set. The machine reads the coded holders and runs the appropriate stored program.

3.12 Using the printer

A separate printer package can be purchased and connected to the STERILE TUBE FUSER - DRY printer port on the rear panel of the machine. To use the printer, attach the printer AC adaptor to a 100 to 240 V~, 50 or 60 Hz power supply and to the printer. Attach the supplied communication cable to the printer DB-25 connector and the STERILE TUBE FUSER - DRY connector.

The printer will print reports displaying the Unit ID, Program Version, Tube data Version, the tube type and OD of the tubing being used, and the current weld number along with other relevant parameters related to the welding conditions of the particular weld being performed.

In addition to displaying the machine setup information, the printer will also print any errors that may occur during operation. This will include the error number, a brief description of the error, and a time stamp.

3 Operation

3.12 Using the printer

4 Troubleshooting

4.1 Error checking

The STERILE TUBE FUSER - DRY is designed to monitor all aspects of its operation. If a step does not perform properly, the unit will not proceed to the next step of the operation.

Step 1: Setup

The machine checks that the holders are correctly installed and no tubing is present. The unit goes through internal electronic diagnostics to check that all systems are functional. Finally, the holders are moved into alignment and checked. STERILE TUBE FUSER - DRY uses position-sensing switches and probes to provide feedback on correct positioning. This ensures long trouble-free operation and minimal realignment requirements.

Step 2: Blade Installed

The unit checks that a blade is installed. Then, the blade is retracted into the machine.

Step 3: Tubing installed

The unit checks that the tubes are correctly installed in each holder and that everything is in the correct position. If all checks are satisfactory, the unit starts heating the blade to about 400°C for sterilization and depyrogenation. An infrared sensor measures the blade temperature and modulates power to control temperature. The program will fail if the measured temperature is different from the controlled temperature.

After a user-set time (5 to 10 seconds), the blade is allowed to cool to a preset temperature (190°C to 270°C) depending on the tubing type and diameter. The cutting process then begins. The blade temperature is controlled at all times, and the program will fail if the temperature is not maintained.

Once the tubing has been cut, the holders are moved into alignment. Position sensors verify that correct positioning has occurred. An error will result if the holders do not move correctly. After alignment, the holders are moved towards each other to form the weld as the blade moves upwards. The amount of movement and timing is programmed and monitored by position sensors.

4 Troubleshooting

4.2 Possible issues

Step 4: Cool down

The unit is then allowed to cool to a preset temperature (typically 50°C) and then held for additional few seconds. This ensures that the blade is safe to touch and the weld is properly annealed. The cover interlock is then released to signal the completion of a successful weld. After the tubing and blade are removed, press the COVER LOCK button to reset the unit for the next weld.

4.2 Possible issues

In the event that the machine malfunctions during the welding process, the cycle will not complete.

Turn the power to the machine **OFF**. Allow the blade to cool down for 30 seconds before switching **ON** again. This should reset the unit.

Check that the holders are correctly installed and do not move in their mounts. Make sure that the left and right holders are for same diameter tube. Make sure the holders are locked in correctly with the locking tabs pulled out towards the front of the machine.

Check that the tubing is the correct size. Check that the machine is set to the correct tubing type.

Try using a new cutting blade.

If the machine does not perform properly, please contact your local GE Healthcare representative.

4.3 General troubleshooting and error messages

For information about general troubleshooting and error messages, refer to the *STERILE TUBE FUSER - DRY and HOT LIPS TUBE SEALER Operating Instructions*.

5 Specifications

5.1 Specifications

Catalog Number:	28-9996-02
Performance:	Tubing diameters from 1/4" to 7/8" using interchangeable tubing holders Typical welding cycle $\approx$ 2 to 3 minutes Non-contact infrared blade temperature sensor Uses single-use PTFE coated cutting blades Serial communication port Can be used to weld most thermoplastic tubing See Appendix A
Dimensions:	W x D x H: 395 mm x 355 mm x 265 mm (15.5" x 14" x 10.4")
Weight:	16 kg (35 lb)
Power:	100 to 240 V~ auto switching, 50 or 60 Hz, 3.3 A
Options:	Tubing holders. Available in size range from 1/4" to 7/8" tubing OD. See Appendix C
Fuse	2 x T4.0 AL 250 V, 5 x 20 mm.
Max Tubing OD	See Appendix A
Min. Tubing OD	See Appendix A
Cutting Blades (BLADES-IR/50)	Single-use. Packaged in 50 Qty.
Typical fusing cycle	2 to 3 minutes
Enclosure	Indoor use only
Pollution	Degree 2
EMC	FCC Part 15 Subpart B Class A and EN61326-1
LVD	IEC/EN/UL61010-1 and CAN/CSA-C22.2 No. 61010-1
Relative humidity	20 to 80% non-condensing

Storage temperature.	-20°C to 60°C
Operating temperature.	0°C to 30°C

5.2 Tubing

Most thermoplastic tubing can be joined in the STERILE TUBE FUSER - DRY. For compatible tube types, refer to Appendix A.

Appendix A Compatible tubing

Introduction

The STERILE TUBE FUSER - DRY is designed to join thermoplastic tubing.

Note: STERILE TUBE FUSER - DRY cannot be used to join silicone tubing or PTFE.

Suitability is based on typical tubing material. The user must determine suitability of autoclaved, irradiated, or otherwise treated tubing.

Tested tubing brands

The tested tubing brands are listed in the table below. The ReadyToProcess™ tube sizes are marked with an x in the table.

* Denotes the factory loaded tubing types.

Tubing dimension (I.D. x O.D. in inches) Data ver: 4.03 Date: 09/11												
Tubing brand	1/8 x 1/4	3/16 x 5/16	3/16 x 3/8	1/4 x 3/8	1/4 x 7/16	5/16 x 7/16	1/4 x 1/2	3/8 x 1/2	7/16 x 9/16	3/8 x 5/8	1/2 x 3/4	5/8 x 7/8
BIOPRENET™					+		+			+	+	
C-FLEX™ 082*	+	+		+	+	+	+	+	+	+	+	+
C-FLEX 374*	+		x	+	+		+x			+x	+x	
PHARMED™ BPT*	+				+	+	+	+		+	+	+
SANIPURE™ 60	+				+					+	+	
SANIPURE BDF*	+				+					+	+	
TYGON™/ PVC	+	+			+		+	+		+	+	

Note: The Tubing Brand names on the instrument screen may not look exactly the same

as in the table above. The Tubing Brand names displayed on the instrument screen are abbreviations with the purpose to identify the tube material

Change selected tubing types

The selected tubing type is shown on the touchscreen display.

For instructions on how to change the tubing type, refer to Change the tubing type on page 33.

Update tubing types

To replace the factory loaded tubing types or to add the ReadyToProcess tube sizes, order STF - DRY TUBE DATA MANAGEMENT TOOL (GUI).

For ordering information, refer to Appendix C.

Appendix B Blade contact materials

The cutting blade is made of a special Nicrome alloy (NiCrA) that has the required electrical characteristics for resistance heating.

The tubing contacts a black polytetrafluoroethylene (PTFE) coating only. This coating is baked on at high temperature and is suitable for food contact applications. The coating ensures minimal adhesion to the tubing during the welding and cutting cycle. This improves the quality of the weld and results in minimal smearing. The inert nature of the coating also eliminates any potential contamination.

The black, reflection-free coating also improves the infra-red emissivity of the blade making it possible to accurately estimate blade temperature with non-contact infrared sensors.

More information about the coating material may be required for cGMP validation. Please contact our Customer Service department and ask for non-disclosure forms.

Appendix C Ordering Information

SI No.	Catalog Number	Description
1	28954327	BLADE REMOVAL TOOL, STFIR
2	WV001984	KEY, REPLACE 6 TUMBLER
3	29002652	STF - DRY TUBE DATA MANAGEMENT TOOL (GUI)
4	28411701	STFIRC BLADES 50
5	29002629	STF DRY PINCH HOLDER 1/4in
6	28411685	STFIRC HOLDER 5/16in
7	28411686	STFIRC HOLDER 3/8in
8	28411683	STFIRC HOLDER 7/16in
9	28411687	STFIRC HOLDER 1/2in
10	28412899	STFIRC HOLDER 9/16in
11	28411681	STFIRC HOLDER 5/8in
12	28411682	STFIRC HOLDER 3/4in
13	28411688	STFIRC HOLDER 7/8in

For more details on ordering information, visit:

www.gelifesciences.com/bioprocess

For local office contact information, visit
www.gelifesciences.com/contact

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