SAKURA

Tissue-Tek® SCA™
Coverslipper

Model 4764 115 VAC
Model 4765 220 VAC or 240 VAC

Operating Manual

Manufactured for:
Sakura Finetechnical Co., Ltd., Tokyo, 103, Japan
Sakura Finetek U.S.A., Inc., Torrance, CA 90504 USA
Sakura Finetek Europe B.V., Zoeterwoude, Netherlands
Made in U.S.A.

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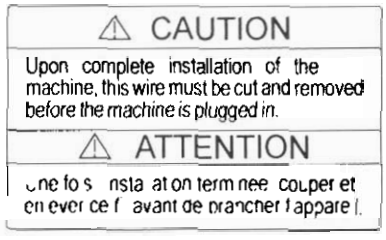

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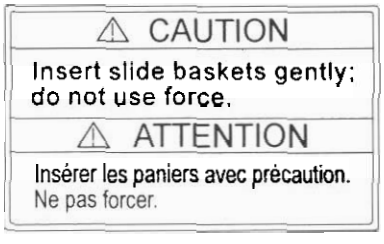

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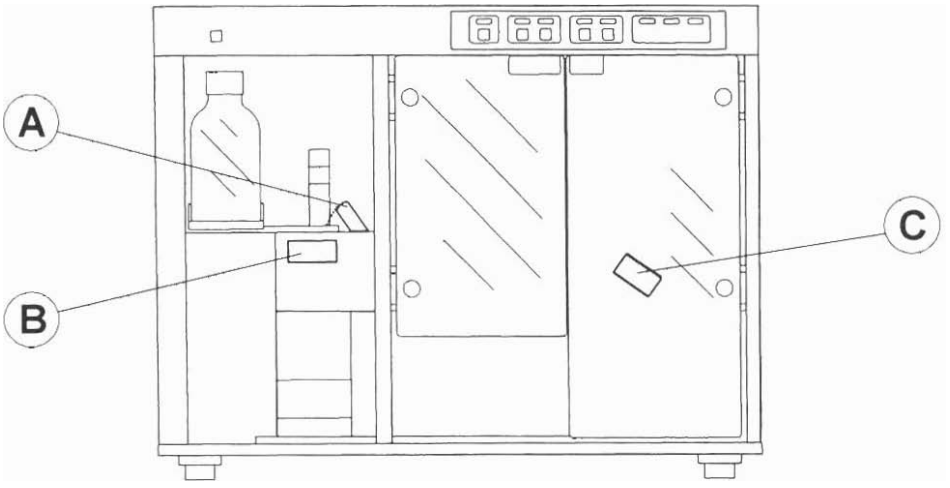
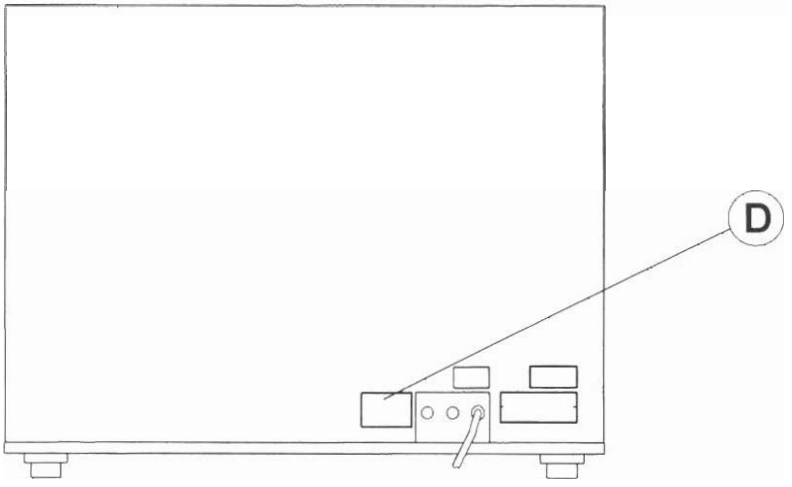
CAUTION AND WARNING LABEL LOCATIONS





INTRODUCTION

General Description

The Tissue-Tek® SCA™ Coverslipper (Figure 1-1) is an automated instrument for coverslipping biological specimens that are mounted on standard 25 x 75 mm (1 x 3 in) microscope slides. The use of a special resin-coated film eliminates the need for cover glasses and liquid mounting media. (We can only recommend the use of Tissue-Tek® Coverslipping Film because of its proven performance.) Coverslipping requires only three seconds per slide, with continuous processing from preloaded baskets. The coverslipped slides dry rapidly and are ready for microscopic examination almost immediately after processing. A microcomputer controls the mechanical movements, as well as the positioning and length of the coverslipping film.

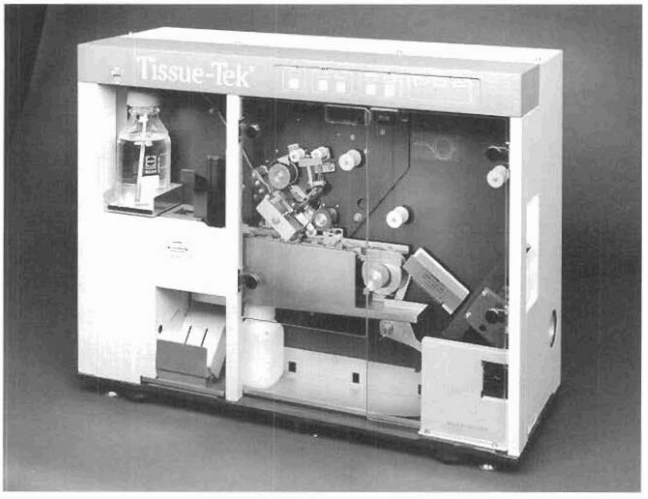


Figure 1-1

All operating functions are controlled through the control panel. Specimen slides that are ready for coverslipping are placed into baskets that are then loaded into the left side of the instrument. Each slide is pushed from the basket and transported along a conveyor, where xylene is dispensed onto the top of the slide. The coverslipping film is fed forward, cut, and applied to the slide. The coverslipped slide is then delivered to a receiving basket on the right side of the instrument. Once the receiving basket is full, it drops into position for removal from the instrument.

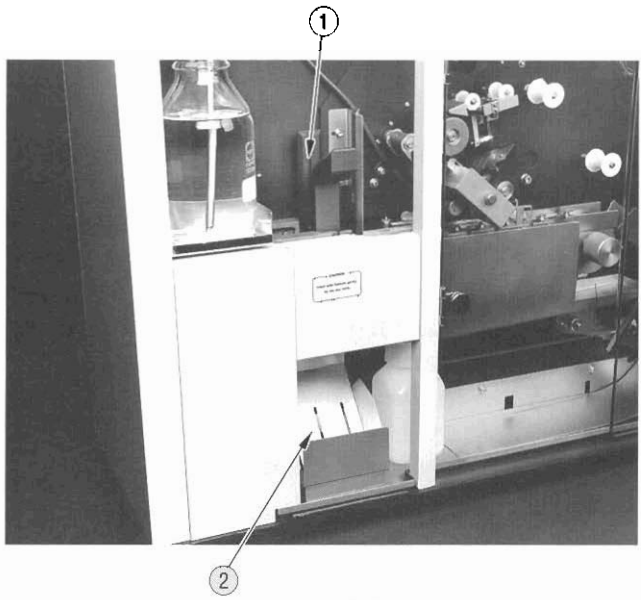


Figure 1-2

Physical Characteristics

Loading Stage (Figure 1-2)

Baskets containing the slides for coverslipping are loaded into the loading channel (1); when empty, the basket drops into the loading basket drop (2).

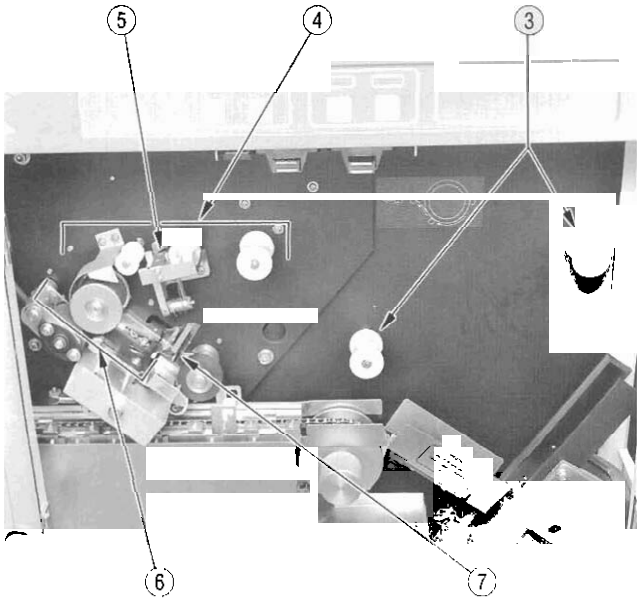


Figure 1-3

Film Mechanism (Figure 1-3)

The Coverslipping Film is loaded into the film area, resting on the two positioning spools (3). The end of the film is threaded through the guide spool assembly (4), which contains a sensor (5) that detects the presence of the film. It is then threaded through a film advance assembly (6) to the blade assembly (7).

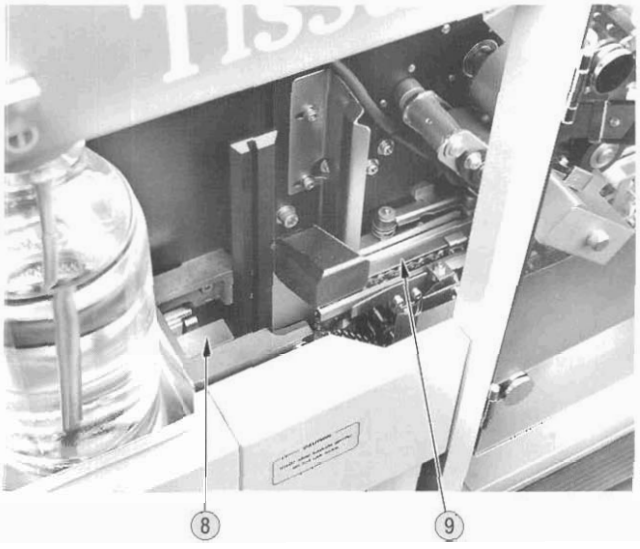


Figure 1-4

Coverslipping Stage (Figures 1-4 and 1-5)

One slide at a time is pushed from the loaded slide basket by an ejector bar (8) and is moved by a conveyor (9) across the coverslipping area. As each slide is pushed from the basket, the basket drops one position so the next slide is properly aligned for ejection.

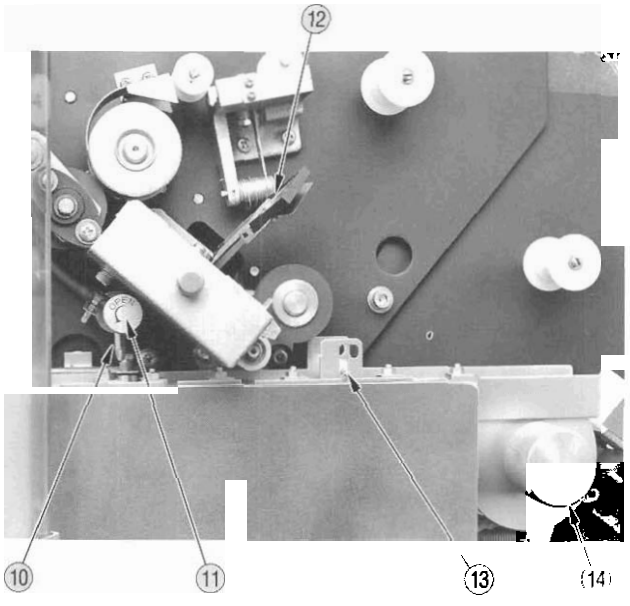


Figure 1-5

As each slide is moved through the coverslipping area, xylene is dispensed from a spout (10) that is connected to the bottle of xylene that is located near the loading channel. The volume of xylene that is dispensed onto the slide is regulated through a flow control knob (11) in the coverslipping area.

After the xylene is dispensed, a selected length of Coverslipping Film is cut by the blade (12) and is then laid in a specific position on the xylene-wet slide just before the slide passes under the pressure roller (13). The xylene activates the resin coating on the film, causing it to adhere to the slide. If necessary, slides can be manually advanced along the conveyor by rotating the manual conveyor knob (14); however, the film advance and xylene dispense will not occur during manual advancement.

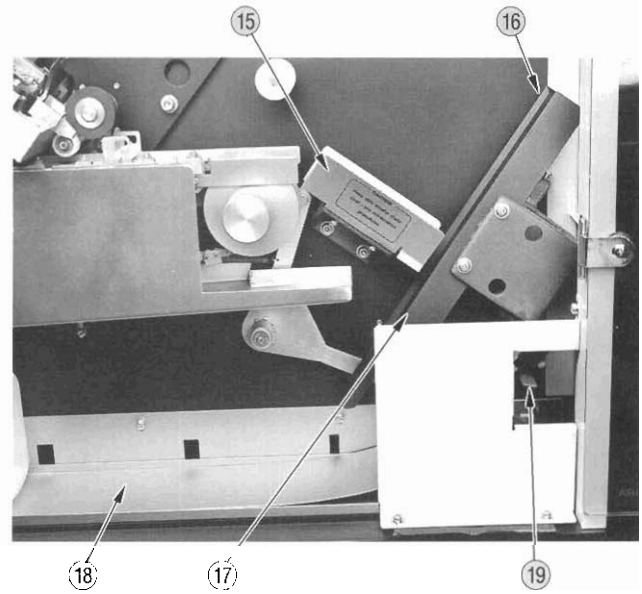


Figure 1-6

Unloading Stage (Figure 1-6)

After the film is applied to the slide, it is delivered down the slide transfer chute (15) to a basket that has been loaded through the receiving channel (16). As each slide enters the basket, the basket drops one position so the next empty slot is available. Once the receiving basket is full, it drops through the receiving basket drop (17) to the slide drying area (18), where it can be removed. A partially filled basket can be released manually by pressing the basket-releasing lever (19).

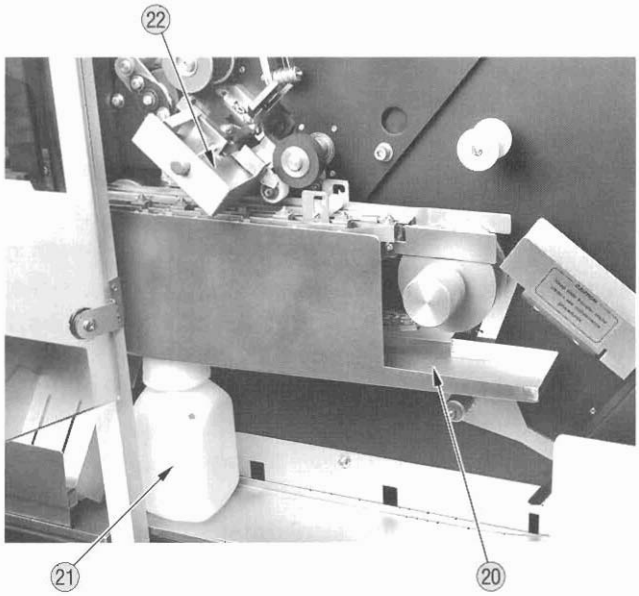


Figure 1-7

Exhaust and Waste Systems (Figure 1-7)

Excess xylene is collected into a drip pan (20), which empties through a spout into the waste bottle (21). Film scrap is collected in the scrap tray (22). The exhaust port, which is located on the right side of the instrument, can be connected by a hose to a fume control unit or a negative-pressure fume hood.

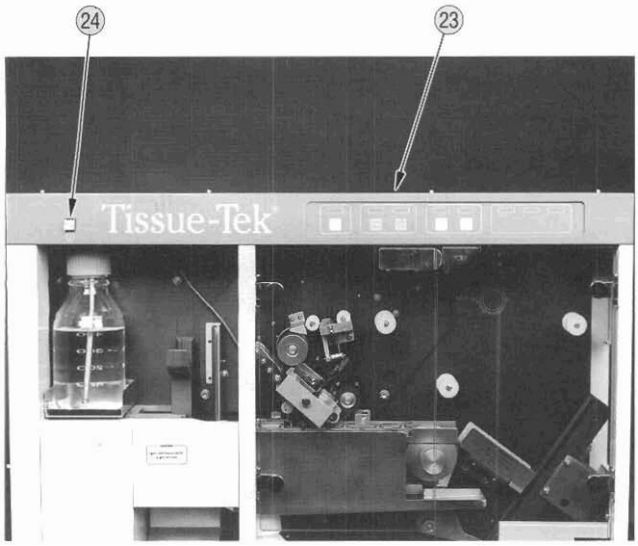


Figure 1-8

Control Panel (Figures 1-8 to 1-10)

All operating functions are controlled through the control panel (23). The instrument power is turned *on* and *off* by pressing the Power button (24), identified by the symbol "⏻."

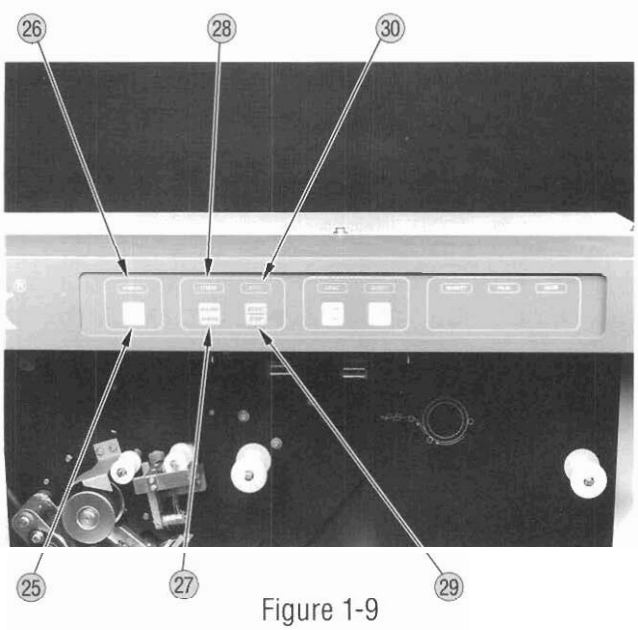


Figure 1-9

The Coverslipping Film is automatically fed through the film advance assembly during installation of the film roll by pressing the FILM keypad (25); the MANUAL indicator light (26) illuminates while this keypad is being pressed. The film advance roller rotates continuously while the film keypad is pressed. Xylene is dispensed through the xylene spout while pressing the XYLENE CHECK keypad (27); the CHECK indicator light (28) illuminates to alert the operator to check the xylene drip rate at the start of each operation. During normal operation, if the instrument detects the presence of a glass slide, it allows xylene to be dispensed onto the slide.The START/STOP keypad (29) is used to start and stop the operating sequence of the instrument; the AUTO indication light (30) illuminates while the instrument is operating.

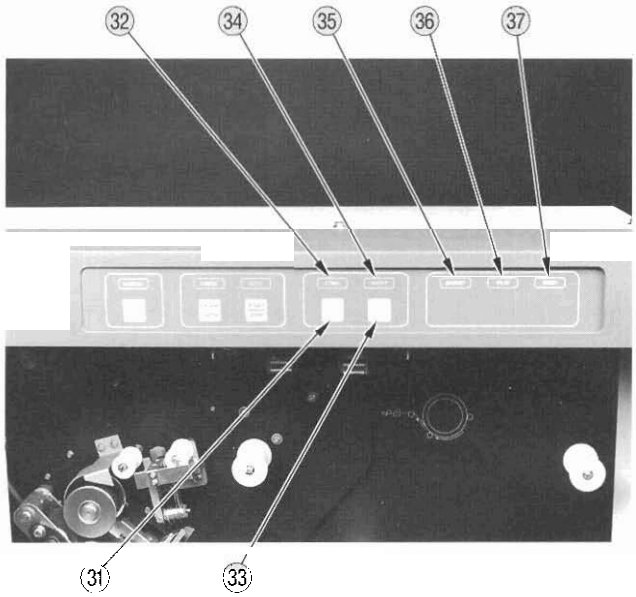


Figure 1-10

The film length can be set to 55 mm by pressing the FILM LONG keypad (31); the LONG indicator light (32) illuminates when this length has been selected. By pressing the FILM SHORT keypad (33), the film length can be set to 45 mm; the SHORT indicator light (34) illuminates when this length has been selected. The instrument always defaults to "LONG" whenever the power is turned *on*.

Three "error" lights will illuminate to alert the operator to conditions that must be corrected before processing can begin or continue. The BASKET indicator light (35) will illuminate when a receiving basket is not present or properly in place. The FILM indicator light (36) will illuminate when the coverslipping film is not loaded or when the roll of film has come to its end. The DOOR indicator light (37) will illuminate when the left door is open. If either door is opened during operation, processing is immediately stopped (opening the right door causes the left side to also open).

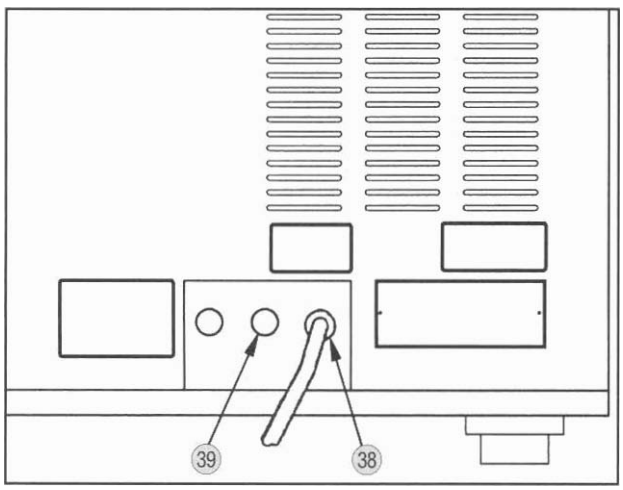


Figure 1-11

Rear of the Instrument (Figure 1-11)

The line cord (38) is permanently attached to the instrument; the other end of the cord attaches into an appropriate AC electrical outlet. The fuse holder (39) holds the fuse that protects against serious electrical overload. The number of fuse holders each unit contains is as follows:

4764 (115 VAC)—1
4765 (220 VAC)—2
4765 (240 VAC)—1

Safety Features

- A safety device on the ejector prevents movement if a slide is misaligned or jammed in the basket. In addition, the pressure exerted by the ejector on a slide is insufficient to cause breakage if the slide is slightly tilted.
- An alarm sounds and the mounting operation is stopped if any of the following conditions occur:
  - either door is opened;
  - the film roll is used up;
  - a receiving basket is not in place;
  - the conveyor stalls.
- The mounting operation (dispensing of xylene and advancement of film) occurs only when a slide is detected on the conveyor. If no slide is in place to receive the xylene and film, these operations do not occur, even though the conveyor continues to run.
- If a slide jam occurs that stops the conveyor, all mechanical movement is stopped, an alarm sounds, and all lights on the control panel will blink repeatedly. (The instrument power must be turned *off* in order to correct this problem and begin processing again.)

Regardless of the various safety features, prompt attention to a potential problem can prevent damage to specimens and/or slides; therefore, the instrument *should always be attended* when it is operating.

Specifications

Power Required

Model 4764–115 VAC, ±10%, 60 Hz, 0.6 A
Model 4765–220 VAC or 240 VAC, ±10%, 50 Hz, 0.3 A

NOTE: The Tissue-Tek SCA Coverslipper has been manufactured and inspected in the following configurations:

Model 4764, 115 VAC, 60 Hz,
Model 4765, 220 VAC, 50 Hz, or
240 VAC, 50 Hz.

Before being used at the alternate frequency setting or at an alternate voltage (such as 240 VAC), changes must be made through the back of the instrument; only an authorized Tissue-Tek Service Engineer should make these changes, as directed in the Service Manual.

Fuse Rating

Model 4764–2.0 amp, 250 volt, Time Delay
Dia. 5 x 20 mm, 1 per unit.

Model 4765–2.0 amp, 250 volt, Time Lag,
Dia. 5 x 20 mm,
220 VAC/ 50 Hz, 2 per unit or
240 VAC/ 50 Hz, 1 per unit

Safety Standards

Tested and listed by Intertek Testing Services (ITS).
Complies with: UL 3101-1 , 1st ed., IEC 1010-1 and CAN/CSA-C22.2 No. 1010.1-92

Dimensions

Depth–27.4 cm (10.8 in.)
Width–72.1 cm (28.4 in.)
Height–55.4 cm (21.8 in.)

Weight

Approximately 50 kg (110 lbs.)

Operating Conditions

Temperature–10°C to 30°C (50°F to 86°F)
Relative Humidity–30% to 70% RH

Processing Speed

60 Hz–One slide every 3.0 seconds
50 Hz–One slide every 3.6 seconds

Acceptable Dimensions for Slides

Width–24.6 to 26.2 mm (0.97 to 1.03 in)
Length–74.7 to 76.5 mm (2.94 to 3.01 in)
Thickness–0.9 to 1.2 mm (0.035 to 0.047 in)

Usable Solvent

Reagent Grade Xylene or Analytical Grade Xylene only

Coverslipping Film

Width–24 mm
Length–55 mm or 45 mm
Material–Cellulose Triacetate with Resin and Back Coatings

INSTALLATION

General

This section provides detailed installation and setup instructions for the Tissue-Tek® SCA™ Coverslipper. The installation steps must be followed correctly to ensure proper operation and service. Read this Operating Manual carefully before attempting to operate the instrument. Follow all instructions carefully.

The Tissue-Tek SCA Coverslipper is a precision instrument and must be handled accordingly. Rough handling or dropping of the instrument will disturb or damage internal components. Always handle the instrument with care.

Environmental Factors

As with all sensitive electronic instruments, prolonged exposure to excessive humidity and temperature should be avoided. Temperature and humidity should be held relatively constant to obtain the highest degree of operating stability. The ambient temperature range for operating the instrument is 10°C to 30°C (50°F to 86°F). The ambient operating humidity range is 30% to 70% relative humidity.

Locate the instrument in a *well-ventilated* area, avoiding exposure to corrosive vapors and extreme variations of temperature or humidity. The area should be *clean and dust-free,* and have a firm, level surface capable of holding at least 50 kg (110 lbs.) of weight. Be sure it is near a power source that meets the electrical requirements (voltage) specified on the rating label located on the rear of the instrument. The power receptacle must be grounded and should be a dedicated line. Avoid proximity to direct sunlight, open windows, sinks, ovens, hot plates, open burners, radiators, and dry ice baths. The instrument should not be used in an explosive atmosphere.

Unpacking

1. Carefully remove the Coverslipper instrument and accessories from their shipping cartons. Inspect the shipping carton and instrument for visible signs of damage. If damage to the instrument exists, immediately file a complaint with the carrier.
2. After the instrument is unpacked, place it on a firm surface in the designated work area. Allow at least 15 to 25 cm (6 to 10 in) of clearance on the right side to allow access to the receiving basket channel.

   CAUTION: The instrument is very heavy and large; therefore, it is strongly recommended that it always be lifted and transported by two people, one on each side. If this is not possible, lift the instrument from the back. Do not lift from the front, as this may break the glass doors.
3. Confirm that all accessories have been included with the instrument:
   - Operating Manual (1)
   - Warranty Card (U.S. customers only)
   - 500 mL glass bottle (xylene bottle) (1)
   - 250 mL polyethylene bottle (waste bottle) (1)
   - Cutting Blades (5)
   - Slide Baskets, 20 slide capacity (10)
   - Basket Handles (5)*
   - Replacement Fuse – Quantity
     Model 4764, 115 VAC (1)
     Model 4765, 220 VAC (2)
     Model 4765, 240 VAC (1)

   If any of these items are missing, contact your Customer Support Representative (refer to Section 9).

*NOTE: These basket handles are for use during manual staining procedures only; they should be removed prior to loading the baskets on the Coverslipper.

4. **Level the Coverslipper as follows:**

   Tools Required:
   9 inch Torpedo Level (or similar)
   10 mm Open ended wrench or crescent wrench

   NOTE: Only the two front feet of the instrument are adjustable.

   a. Level the instrument front-to-back by placing the narrow edge of the level vertically on the inner back wall between the film roll positioning spools (film must be removed first). Turn the left and right front feet an equal number of turns so that the side-to-side leveling is maintained.

   b. Check the side-to-side leveling by placing the level horizontally on the black ledge of the instrument below the glass doors.

   The Coverslipper must be level to prevent bubbles on coverslips and to prevent jams in the Coverslipper slide chute.

5. Remove the various items of packing material in and on the instrument. For example, the doors will be taped together; a foam block holds the xylene tube in place; and a loop of wire holds the ejector rod in place. These are all needed only during shipping and must be removed before using the instrument.

6. Plug the instrument power cord into an appropriate grounded AC electrical outlet. The outlet should be a dedicated line and must be grounded. If no grounded receptacle is available, use a grounding adapter. **Do not connect the ground to gas or water pipes.**

   NOTE: Be sure the outlet supplies the proper voltage and frequency (Hertz) for your instrument. Refer to the rating label located on the rear of the instrument to determine the proper voltage rating.

7. Make sure the glass xylene bottle is clean and dry. Fill the bottle with xylene to the upper mark on the bottle. Place the metal tube into the bottle, then place the bottle onto the platform in the upper left corner of the instrument (Figure 2-1).

   CAUTION: Do not overtighten the Xylene Reservoir Bottle Cap. A snug tightness is adequate to maintain system pressure during operation. Excessive tightening can strip the cap threads, preventing closure and requiring cap replacement.

   NOTE: Use high grade xylene only (e.g., A.S.C. Reagent Grade) for successful instrument operation and film adhesion. Recycled or reclaimed xylene, xylene substitutes, or xylene that has been contaminated by alcohol **must never** be used during coverslipping procedures.

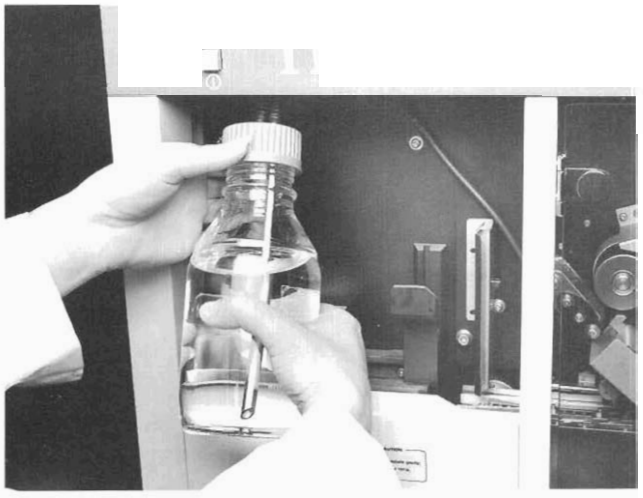


Figure 2-1

Place the cap onto the bottle and tighten by turning the bottle counterclockwise. Be sure the cap is securely tightened; otherwise, xylene will not be properly dispensed. Check that all connecting tubing is not crimped.

8. Fit the waste bottle onto the waste fluid spout by tilting the bottle slightly until the spout fits into the opening in the lid of the waste bottle (Figure 2-2).

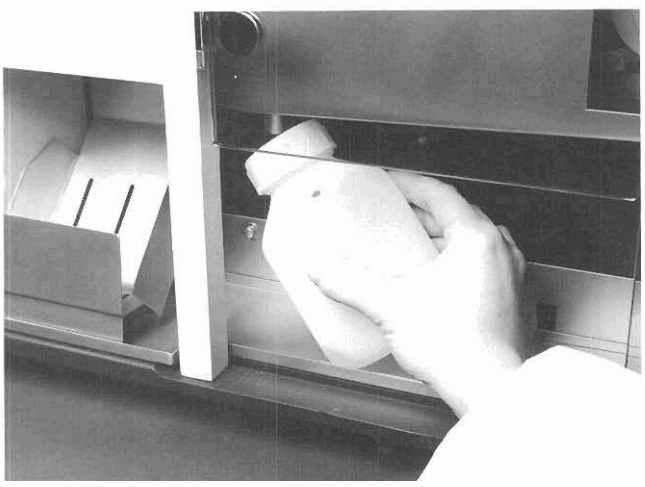


Figure 2-2

Place the bottle so the small air hole at the top of the bottle is to the right. (This will help prevent waste fluid from spilling out of the hole when the bottle is removed.)

9. If one is available, connect a fume control unit or fume hood to the Coverslipper by attaching one end of a vent hose to the fume port on the lower right side of the instrument. Attach the other end of the vent hose to the appropriate port in the fume control unit or to the fume hood. To be effective, the fume control unit or hood must create a negative air flow that will pull the xylene fumes from within the Coverslipper.
10. Turn the instrument power *on* by firmly pressing the power button (⏻) found on the left side of the control panel. The instrument will beep twice; each of the indicator lights on the control panel will illuminate momentarily as an automatic system check is performed; then a single beep will sound. The XYLENE CHECK and LONG lights will remain illuminated, as will the BASKET and FILM lights since the film has not yet been loaded and a receiving basket is not yet in place.
11. Open the glass doors on the front of the instrument by pressing the metal plate on the upper part of each door. This will disengage the lock and allow the door to swing open. (If the right door is opened first, it will cause the left door to also open.) The DOOR indicator light will illuminate when the left door is open.
12. Fill the xylene line by turning the xylene adjustment knob 2-3 full turns counterclockwise (Figure 2-3) and pressing the XYLENE CHECK keypad until xylene is dripping through the xylene spout without any air bubbles.

    NOTE: Failure to purge the line may result in bubbles after adding xylene to the Reservoir Bottle and also may result in bubbles under the Film due to improper delivery of xylene to the slide.

    Once all air is removed from the line, turn the xylene adjustment knob clockwise until it is completely closed. Then, *very gradually* turn the knob counterclockwise until an appropriate volume of xylene is being dispensed.

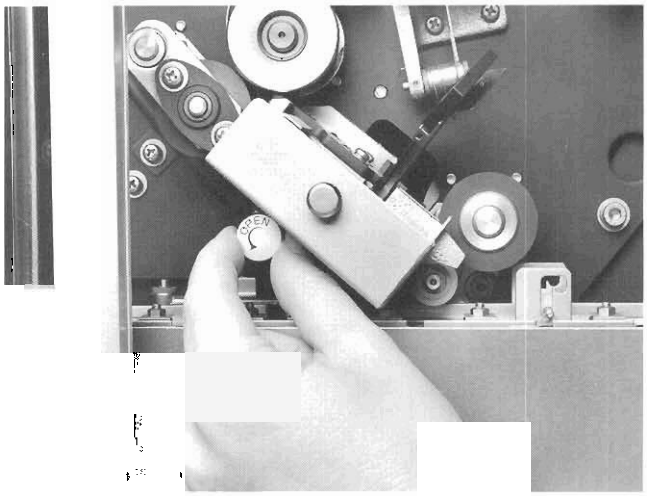


Figure 2-3

The recommended drip rate for histology and hematology specimens is 6 to 9 drops per slide and, for cytology specimens, 8 to 10 drops per slide. A basket containing 5 or 6 blank slides can be processed to ensure a proper drip rate.

NOTE: There is no stop on the volume adjustment knob; if turned sufficiently counterclockwise, it will pull completely out of the instrument. However, the range of adjustment that is necessary for processing slides (from the fully closed position to several drops per slide) is only about one quarter of a turn.

13. Locate the serial number label found on the right side of the instrument, in the lower front corner (Figure 2-4); a duplicate label is also found on the rear of the instrument. Write the installation date, model number, and instrument serial number on the Warranty Registration Card found in the front of this manual. Also write the installation date, model number, and serial number in the spaces provided in the "Preservice Checklist" in Section 9. Completely fill out the Warranty Registration Card and mail.

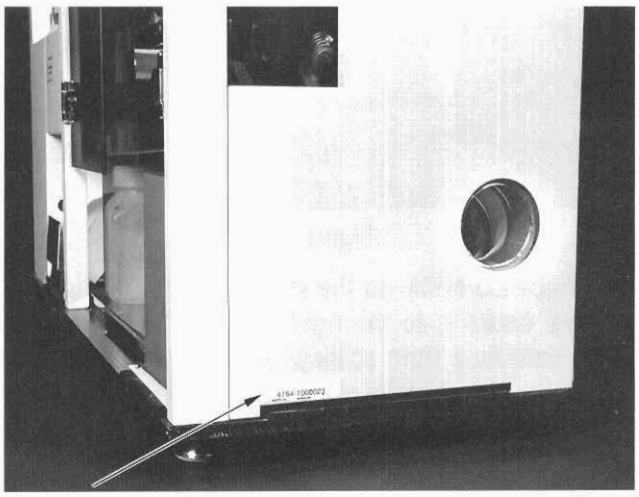


Figure 2-4

Before beginning normal instrument use, carefully review Section 4, OPERATING INSTRUCTIONS, and Section 6, CARE OF THE INSTRUMENT, to become familiar with the operating procedures and instrument cleaning requirements.

SLIDE PREPARATION AND HANDLING

Precautions on Slide Selection

1. Slides on which one entire side is frosted (sometimes used in cytology) are not recommended for use on this instrument, as there is an increased tendency for bubbles to be trapped under the Coverslipping Film with this type of slide.
2. Narrow slides, such as the V/C/E slides sometimes used for cytology, fit very loosely into the Coverslipper baskets. They have a tendency to misalign while being inserted into the baskets. Extreme care should be taken if using these slides.

Preparation of Slides Prior to Coverslipping

Only stains calling for a solvent-based mounting medium should be used to stain slides that will be coverslipped on the Tissue-Tek® SCA Coverslipper. Many of the immunohistochemical stains require the use of water-based mounting media; these are not appropriate for use in conjunction with this instrument.

Always use clean, reagent grade xylene for the final steps during staining of the specimens. Small amounts of alcohol or water left on the slides may interfere with the adhesion of the Coverslipping Film. For best results, change the xylene in the final rinse after every 10 baskets or once a day, depending upon use. If small bubbles are noticed in the bottom of the xylene container or the xylene appears cloudy, the xylene should be changed.

Slides should be free of paraffin, foreign debris, and staining residue.

NOTE: Specimen adhesion and tissue/specimen debris on the back of the stained slides may cause sticking in the slide delivery and transfer chute pathways.
Reminder: Histology microtomy techniques may require modification to prevent unnecessary slide debris.

Slides that are stained or prepared without xylene in the final step (e.g., hematology smears) should be immersed for several minutes in xylene prior to coverslipping to remove any immersion oil or other residues.

The Coverslipping film has a resin layer of finite thickness. The available resin cannot accommodate wide variations in specimen thickness. Bubbles may occur and render specimens difficult to diagnose after storage.

NOTE: Cytology specimens e.g., Pap smears, sputum preparations, and bronchial lavages, may present specimen thickness that may vary within wide extremes. Inspect slides to reduce and/or limit thickness variations to produce quality Film coverslipped slides.

Do not use redistilled xylene or any xylene substitutes in the instrument.

Handling of Coverslipped Slides

Removal of Immersion Oil

Immersion oil can be removed from a coverslipped slide by dipping the slide into xylene for a few seconds, draining, and wiping the slide dry with a soft, nonabrasive, low-lint cloth such as Kaydry®* Disposable Towels.

Cleaning the Coverslipped Slides

Fingerprints can be removed from the coverslipped slides using a soft, nonabrasive, low-lint cloth.

Writing on the Coverslipped Slides

If you wish to mark a suspicious area on the slide, a permanent, soft-tipped marker can be used. Transparency markers work the best; however, many other permanent markers can also be used. To remove the markings, gently wipe the slide with a soft, nonabrasive cloth dampened with alcohol.

*Kaydry® is a registered trademark of Kimberly-Clark Corp.

Removal of the Coverslipping Film

On occasion, it may be necessary to remove the Coverslipping Film from a slide, either to restain the specimen or because a bubble is obscuring the field of view. Post slide storage techniques require observation and evaluation of the specimen in relation to the microscope slide and the Coverslipping Film. Three basic recoverslipping methods are available to choose from.

Equipment and Reagents Needed

Coplin jars
Acetone
Absolute alcohol
Xylene–reagent grade
Forceps or teasing needle

Method "A" has been tested using cytology, histology, and hematology specimens. The film is removed with virtually no damage to the specimen and the slide can be restained and/or recoverslipped.

1. Place the coverslipped slide into a coplin jar filled with acetone. Allow it to remain for three to five minutes. Remove the slide and, using a pair of forceps or a teasing needle, lift the coverslipping film off the slide. A thin layer of mounting medium will remain on the slide.

   NOTE: After three minutes of exposure to the acetone, the film will still be attached to the slide and must be gently lifted off. This limits the direct exposure of the stained tissue to the acetone, reducing the amount of depolarization. This shorter time period should be used if the slide is just being recoverslipped. After about five minutes of exposure, the film falls off the slide by itself. However, the tissue is now in direct contact with the acetone, and the stain will fade. This is not a problem if the tissue is to be decolorized and restained.

2. Transfer the slide through three changes of absolute alcohol for 30 seconds each to remove the acetone residue. Follow with three changes of xylene for one minute each to remove the mounting medium.
3. If the slide is to be immediately recoverslipped, remove it from the last xylene bath and immediately process it on the Tissue-Tek Coverslipper. If the specimen is to be decolorized and restained, remove the slide from the last xylene bath and place it into a fourth change of absolute alcohol for 30 seconds. Decolorize and restain the specimen as desired.

Method "B" results in retaining the original piece of coverslipping film. This would be necessary if any specimen is possibly attached to the Film and not to the slide.

1. Immerse the slide in xylene for approximately one minute to reactivate the Film resin.
2. Place the slide on a flat surface. Gently press the Film surface with a paper towel for five to ten seconds to absorb excess xylene and to tease out any bubble. (Do not work out a bubble using any sharp object which would mar the surface of the Film.)

Method "C" removes and prevents the reuse of that piece of coverslipping Film. This would be used to completely remove the coverslipping Film. This method would also be utilized if a bubble near the edge or edge release is observed.

1. Place slide in acetone for 30 seconds to five minutes to loosen the film.
2. Immediately place slide in 50% xylene/50% acetone solution for 30 to 45 seconds.
3. Carefully peel the loosened Coverslipping film from the slide surface. If film is difficult to remove, repeat steps 1 and 2.
4. Immediately place the slide in xylene for one minute and gently agitate.
5. Transfer the slide to a second xylene rinse for one minute to ensure complete removal of coverslipping resin.
6. Recoverslip the specimen slide using recommended operating procedures.

Storage of Coverslipped Slides

Slides should be stored in a vertical position front-to-back. Slides can be stored within 24 hours after being coverslipped. Any amount of water or alcohol remaining on the slides may interfere with immediate or long-term adherence of the coverslipper film.

Avoid storing Film coverslipped slides in wet or humid areas. Film coverslipped slides should be stored in an environment in which temperature and humidity are stable and adhere to the following limits:

Relative Humidity: less than 50%
Temperature: 22°C ± 3°C

Approx. 72°F ± 5°F

NOTE: Cellulose triacetate film is sensitive to temperature and moisture. Care must be taken to avoid exposure to temperatures or moisture outside the recommended ranges. Failure to remove all water and alcohol during the staining process and failure to follow the storage guidelines may result in film delaminating from the slide. There are no real time stability data on cellulose triacetate film beyond nine years, as of March 1997. The extent of edge peeling and film delamination beyond nine years is unknown at this time.

Archived slides should be stored in a vertical upright position with the Coverslipping Film surface of one slide touching the glass back surface of the adjacent slide.

Use of slide storage boxes or folders which separate slides is not recommended for long-term storage of Film coverslipped slides.

Avoid long exposure to fluorescent light or sunlight, which may cause stain fading.

As a result of the variation in slide preparation and storage conditions, it is advisable to conduct an annual, random examination of archived slides.

The CLIA guidelines for archived slides are as follows:

CYTOLOGY SLIDES:
negative, unsatisfactory: 5 years
suspicious, positive: 5 years

HISTOLOGY SLIDES:
all stained slides: 10 years

OPERATING INSTRUCTIONS

The Tissue-Tek® SCA™ Coverslipper is capable of performing continuous, rapid coverslipping by simple operating steps. **Because of the speed with which the coverslipping process occurs, it is recommended the instrument be attended at all times during operation.**

Loading of Slides

Slides must be correctly inserted into the baskets in order to be properly coverslipped. Once the slides have been stained (refer to Section 3, "Preparation of Slides," for helpful information), load them into the baskets, taking the following precautions (Figure 4-1):

- The specimen side of the slide must face forward (toward the words "UP SIDE" on the basket);
- The label end of the slide must be to the outside (top) of the basket;
- Each slide must be in parallel grooves

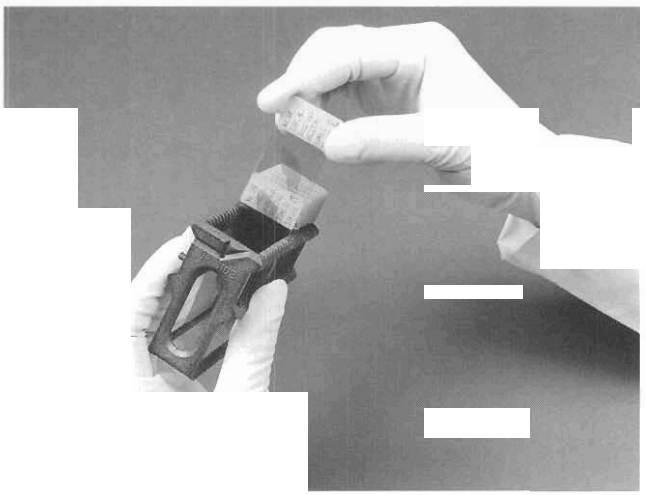


Figure 4-1

Each basket holds 20 slides; the empty grooves in a partially filled basket may be anywhere in the basket.

To prevent damage to the specimens, keep the slides totally immersed in clean xylene until they are loaded onto the Coverslipper instrument.

NOTE: The slide basket should be quickly blotted and drained prior to placement on the loading stage. This will decrease the xylene fumes generated during handling of the basket and minimize excess xylene in the slide transfer pathways.

Preparation of Film

Before using a roll of Coverslipping Film, it is imperative that the film be allowed to acclimate for at least one full day (24 hours) *to the laboratory conditions in which it will be used.* The film roll should be removed from the box and the plastic bag opened fully to allow complete exchange of air to the film. Alternatively, the film can be removed from the bag and stored in a cupboard or in the instrument, as long as it is protected from dust, moisture, and chemical vapors. Failure to allow complete acclimation may result in bubbles, curling edges, or poor adherence of the film to the slide, the degree of which depends upon the specific conditions (temperature and humidity) in the laboratory in comparison to the conditions of the film at the time of use.

The end of a new roll of film will be secured with a piece of adhesive tape. Carefully remove the tape, ensuring that *all* adhesive is removed with the tape. Discard the first 75 cm (2½ feet) of Film before installing a new roll on the Coverslipper. This will ensure removal of the blemished area originally secured with tape.

Storage of Unused Film

Avoid storing Film in humid areas. Storage conditions for Film prior to use:

Relative Humidity:	30 to 70%
Temperature:	10 to 30°C; 50 to 86°F

Packaged rolls of film should not be stored near laboratory chemicals. The solvent fumes will penetrate through the cardboard box and plastic bag, resulting in degradation of the Film coatings.

We can only recommend the use of Tissue-Tek Coverslipping Film, Product Code #4770.

Routine Operation

1. Check the fluid level in the xylene bottle and refill if necessary. Be sure there is sufficient xylene for the entire run. If the bottle must be refilled, be sure the cap and gaskets are properly seated on the bottle and that ALL air bubbles have been bled from the line before starting the run. Refer to Section 6, "Periodic Maintenance" for complete instructions.

   NOTE: Failure to purge the line may result in bubbles after adding xylene to the Reservoir Bottle and may also result in bubbles under the Film due to improper delivery of xylene to the slide.

2. Check the volume in the waste bottle. Empty it, if necessary, into an appropriate disposal container and replace under the waste spout.

3. Turn the instrument power *on* by firmly pressing the power button (⏻) found on the left side of the control panel. After an internal check, during which time each of the indicator lights on the control panel will illuminate momentarily, a single beep will sound. The XYLENE CHECK and LONG lights will remain illuminated. If the film has not been loaded and/or receiving baskets are not in place, the FILM and/or BASKET lights will also be illuminated.

4. Open the glass doors on the front of the instrument by pressing the metal plate on the upper part of each door. (If the right door is opened first, it will cause the left door to also open.) The DOOR indicator light will illuminate when the left door is open.

5. Load the Coverslipping Film as follows:

   a. **Obtain a roll of film that has acclimated to the laboratory conditions for at least 24 hours.** Handle the film carefully, *holding by the edges only.* With the film unrolling from *underneath,* seat the film onto the tops of the two positioning spools, ensuring that the end of the film is near the first guide spool. When the roll is in position, it will rest against the positioning spools.

   b. Draw out the end of the film, laying it across the upper side of the first (large) guide spool, then to the underside of the two small guide spools, through the film guide, and then around the curve of the large film advance roller (Figure 4-2).

   NOTE: Be careful not to damage the film when placing it on the rollers and threading it. Handle the film roll carefully. Avoid handling the film surface as much as possible. Any contact with xylene could damage the film.

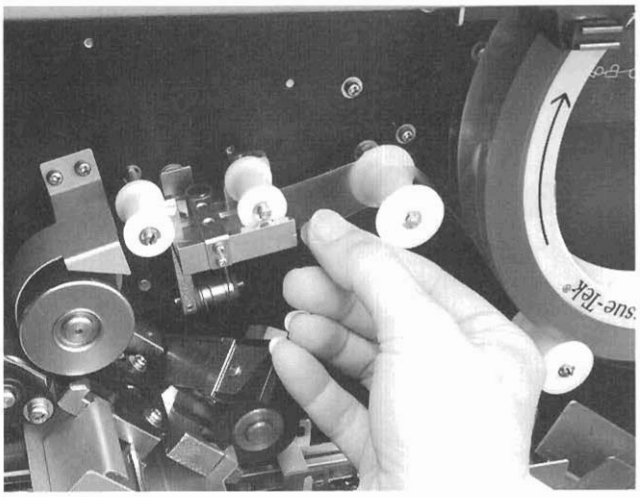


Figure 4-2

c. Press and hold the FILM keypad. The end of the film should be captured and begin to feed automatically. If this does not occur, carefully feed the film with the other hand while continuing to hold the FILM keypad. The film will then continue to thread through the roller and film press system (Figure 4-3). Release the keypad when the film is just past the blade (3 to 6 mm [⅛ to ¼ inch]).

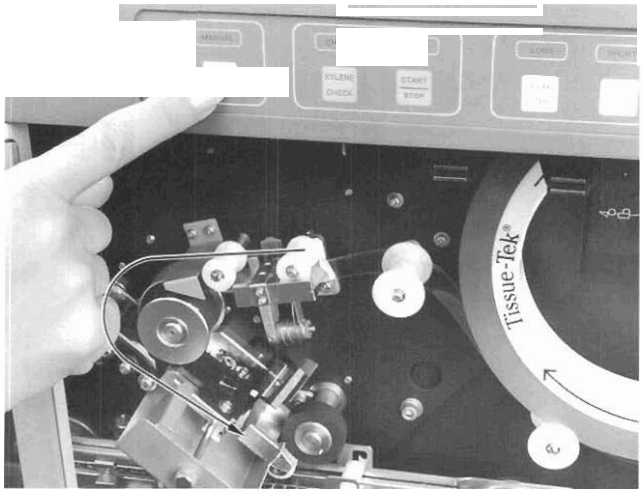


Figure 4-3

NOTE: If the film jams while threading, turn the power *off,* pull the film back through (unthread it), and cut off the end if it is crimped or damaged. Turn the power back *on* and thread the film again, beginning at Step b above.

d. Cut the film by pressing down on the tip of the blade holder. The film is now properly loaded and ready for use.

NOTE 1: If the FILM light is illuminated after loading the film, the film is not properly loaded. Turn the instrument power *off,* pull the film back through the roller system (unthread it), turn the power back *on,* and reload the film, beginning with Step 5-b above.

NOTE 2: The film scrap should fall into the scrap tray; however, if it is too long, it may fall along the film guide. It should be carefully removed from the guide so it does not fall into the conveyor mechanism.

6. Load one or two empty baskets into the receiving channel (Figure 4-4). The baskets must be loaded with the "UP SIDE" facing up and the basket guide pin inserted into the groove of the receiving channel. (Notice the guide pin [the small peg on the basket] allows entry into the channel in only one direction; be sure this guide pin is not broken off.)

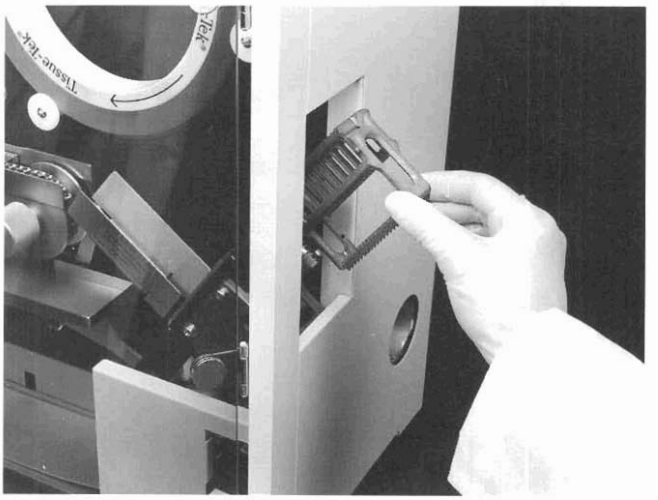


Figure 4-4

CAUTION: Do not stack two full baskets in the loading channel at the same time. Do not force baskets on or down the loading channel. Disregarding these instructions may damage the delivery catches and cause a failure.

7. Load into the loading channel the first basket filled with slides to be coverslipped (Figure 4-5). The "UP SIDE" faces up, and the guide pin inserts into the groove of the loading channel.

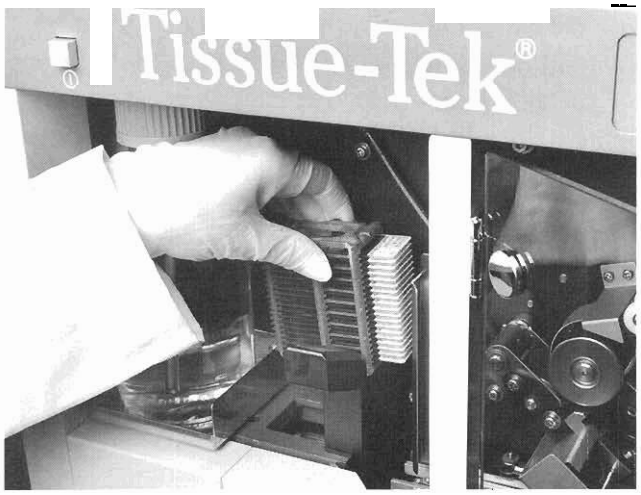


Figure 4-5

8. Close both doors, closing the right side first.
9. The film length defaults to "LONG" (55 mm). This film length will cover most of the clear portion of a frosted-end slide and is suitable for larger specimens or cytological smears. Change the film length to "SHORT" (45 mm), if desired, by pressing the SHORT keypad. The "SHORT" setting provides adequate coverage for many small histology or biopsy specimens. The film length may be changed back to "LONG" simply by pressing the LONG keypad.

   NOTE: The film length may be changed anytime the instrument is not operating; it cannot be changed while the instrument is processing slides nor when the instrument automatically stops itself because of an error condition, until the error has been corrected.

10. As prompted by the illuminated CHECK light, confirm the xylene drip volume by pressing the XYLENE CHECK keypad (Figure 4-6). The xylene should be dripping at the rate of 6 to 9 drops per slide for histology and hematology specimens and 8 to 10 drops per slide for cytology specimens. Adjust the volume, if necessary, by turning the xylene adjustment knob. Turn the knob counterclockwise to increase the volume, clockwise to decrease it. A basket of 5 to 6 blank slides can be processed to ensure that the appropriate volume of xylene is being dispensed on each slide. For proper coverslipping, xylene must cover the entire sample area of the slide.

    NOTE: If the film is threaded to *just past* the sensor, the blank slides can be processed without wasting film.

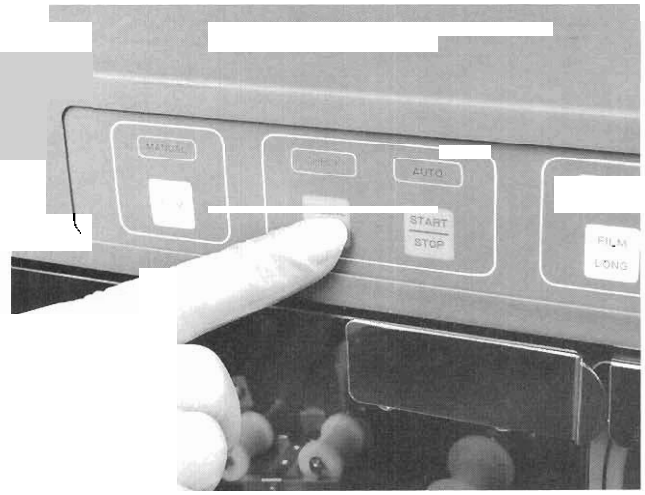


Figure 4-6

11. Check that all lights are *off* with exception of the film length indicator. If any other light is illuminated, the instrument will not start processing and the error condition must be corrected.
12. Press the START keypad (Figure 4-7). The instrument will begin processing slides at the rate of one every three seconds (at 60 Hz). If necessary, the xylene drip volume should be adjusted so the appropriate volume is being dispensed onto each slide.

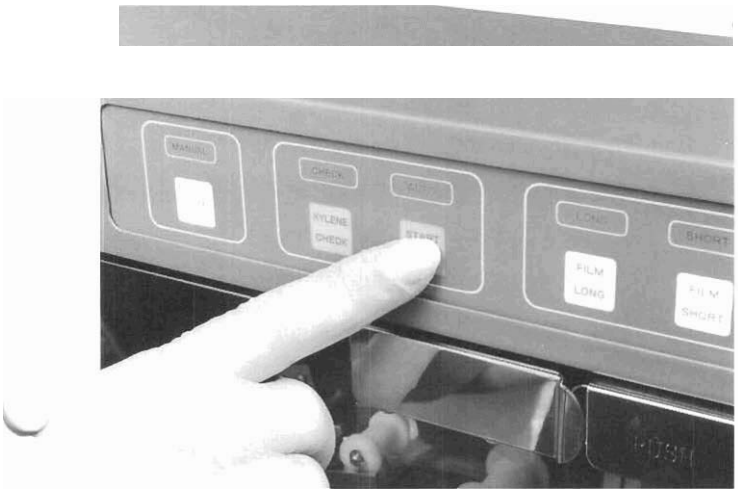


Figure 4-7

13. **The instrument should be attended at all times.** For continuous operation, the following functions must be performed:
    a. After half the slides from the first basket have been processed, a new basket of slides for coverslipping can be added to the loading channel.

       CAUTION: Do not stack two full baskets in the loading channel at the same time. Do not force baskets on or down the loading channel. Disregarding these instructions may damage the delivery catches and cause a failure.

    b. Remove each empty basket after it drops from the loading channel, before the next basket drops down.
    c. An empty basket must always be in place in the receiving channel. As each receiving basket fills and falls through the receiving basket drop, place an empty basket into the receiving channel (two baskets can be in place at once). Move the filled receiving basket to the left and remove it from the instrument through the opening under the left door (*do NOT open the door or the instrument will stop processing*).
14. When all slides have been coverslipped and deposited in the receiving basket, press STOP to end the mechanical movement of the instrument.
15. To restart the instrument after it has been stopped (*without* turning the power *off*):
    a. Ensure any condition that caused the instrument to stop processing has been corrected:
       - Film is present and correctly loaded;
       - Empty basket is in place in the receiving channel;
       - Both doors are closed (close the right side first).
    b. Load a new basket of slides for coverslipping into the loading channel, if necessary.
    c. Press the XYLENE CHECK keypad to verify the xylene drip rate.
    d. Press START to begin operation again

16. If completely finished with the run, turn the instrument power *off* by pressing the power button (be sure the STOP keypad has been pressed first). The film may be left in the instrument; however, it should be pulled back through the threading mechanism and rewound onto the roll.

    NOTE: If the film is left threaded on the instrument, it will "remember" the shape of the roller mechanism and will not lie flat when placed on a slide. Therefore, when coverslipping has been completed for the day, unthread the film. This prevents bending of the film during extended periods of nonuse. This also prepares the instrument for daily maintenance of the film and slide transfer pathways.

17. If a fume control unit or fume hood is attached to the Coverslipper, leave the fume unit *on* between intermittent runs on the Coverslipper to remove any lingering xylene fumes in the instrument.

Operating Precautions

1. If a malfunction occurs that necessitates stopping the normal operation of the instrument, press the power button to stop all movement *immediately* or press the STOP keypad (if an immediate stop is not required). If a slide jam or breakage occurs, the power should immediately be turned *off;* with most other operational problems, the STOP keypad may be pressed.

   NOTE: Whenever possible, use the STOP keypad to stop the processing. Use the power button only when absolutely necessary, as extra steps and time are required to begin processing again when the instrument is stopped by turning the power *off.*

2. If the malfunction cannot be quickly corrected, remove the loaded basket (containing the slides to be coverslipped) and any slides on the conveyor, as directed below. Place all unmounted slides in xylene to protect the specimens.
3. Handle the slide baskets carefully to avoid breakage. Do not use a basket on the Coverslipper if it is cracked or damaged in any way.
4. To remove baskets in the loading channel:
   a. Be sure all mechanical movement has ceased before attempting to remove the basket.
   b. If the operation of the instrument was stopped for any of the following reasons, proceed as instructed in Step 4-d below.
      - The STOP key was pressed;
      - No receiving basket was in place;
      - Insufficient film was left on the roll;
      - One or both doors was opened.

      If the instrument was stopped for any other reason, proceed with Step 4-c below.
   c. If operation of the instrument was stopped by turning the power *off,* by a power failure, or because of a slide jam or breakage, open the doors and turn the manual crank for the conveyor in a clockwise direction until the slide ejector is positioned at the extreme left side of its path.
   d. Remove the basket by lifting it upward along the loading channel. Do not attempt to push the basket downward.

5. To remove slides on the conveyor:
   a. Be sure all mechanical movement has ceased before attempting to remove the slide(s).
   b. Open the doors and lift the pressure roller onto the small catches on each side of the roller. This will prevent the roller from coming into contact with the unprotected specimen as the slide passes underneath. Then turn the manual crank on the conveyor in a clockwise direction to move the slide along the conveyor (Figure 4-8).

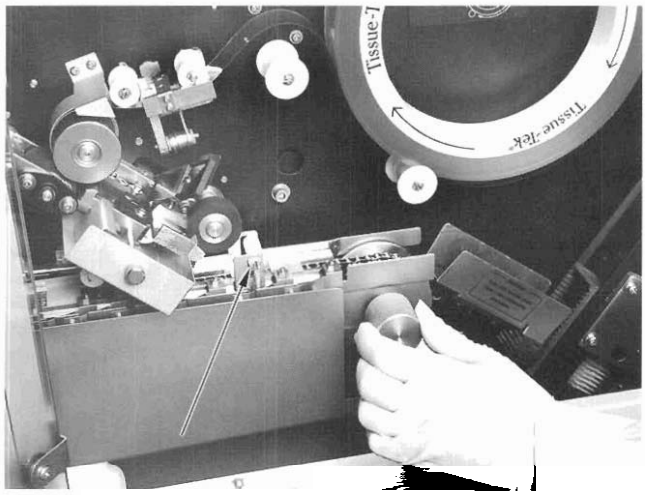


Figure 4-8

   c. When the slide comes near the end of the conveyor, remove it either with the fingers or with forceps, taking care not to damage the specimen.
   d. After all slides have been removed from the conveyor, release the pressure roller from its catches and lower it back into its normal position.

6. Remove the receiving basket, if it is only partially filled and has not fallen into the receiving basket drop, by pressing down on the basket release lever (Figure 4-9). The basket will fall through the basket drop.

   NOTE: Do NOT press this lever while slides are processing, as the BASKET alarm will be activated and the instrument stopped.

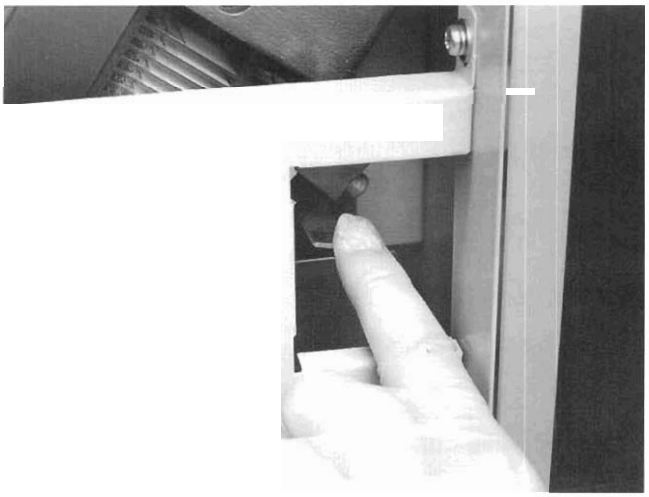


Figure 4-9

7. To restart the instrument after power is turned *off:*
   a. Correct the condition that caused the power to be turned *off.*
   b. Remove all slides from the conveyor.
   c. Turn the power *on* by pressing the power button.
   d. Press the SHORT keypad if using the short film length.
   e. Press the FILM keypad until a small length of film is showing. Cut the end of the film by pressing down on the film cutter.
   f. If necessary, place the loaded basket into the loading channel and an empty basket into the receiving channel.
   g. Press the XYLENE CHECK keypad
   h. Press the START keypad

8. If a slide does not correctly load into the receiving basket:
   a. Stop the slide processing by pressing STOP.

      NOTE: Whenever possible, stop the operation by pressing STOP, rather than by turning the instrument power *off*, as restarting the operation is much simpler when STOP is used.

   b. Remove the slide and correct any other malfunctions that may have caused the slide to incorrectly load into the receiving basket.
   c. Remove the receiving basket by pressing the basket release lever. Place an empty basket into the receiving channel.
   d. Press the XYLENE CHECK keypad to confirm the drip rate.
   e. Press the START keypad.

ACCESSORIES

Figure 5-1

Tissue-Tek® Coverslipping Film

Tissue-Tek Coverslipping Film (Figure 5-1) is a unique cellulose triacetate film that is coated on one side with a mounting medium that is activated by xylene and on the other side with a coating that reduces permeability to air and moisture. When the film is applied to a glass slide onto which xylene has been dispensed, the film adheres to the slide, forming a protective covering for the specimen. The film is optically clear and colorless, and the mounted slides are ready for microscopic examination almost immediately after preparation. Each roll of film is sufficient to coverslip at least 1000 slides. The film is available as Product No. 4770 (5 rolls/case).

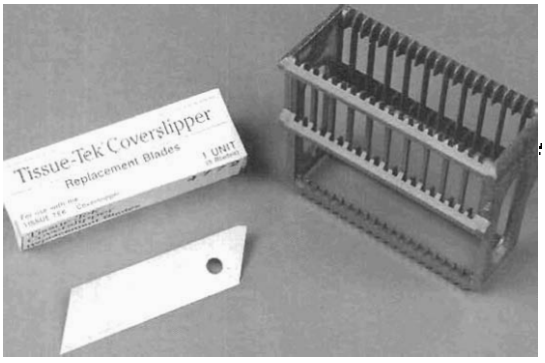


Figure 5-2

Tissue-Tek® Coverslipper Blades

Replacement blades for the Coverslipper (Figure 5-2) are available as Product No. 4772 (5 blades/carton). The blade should be replaced after every 10 rolls of film (approximately 10,000 slides) or whenever the film cut is ragged or torn.

Tissue-Tek® Coverslipper Slide Baskets

The Tissue-Tek Coverslipper Baskets (Figure 5-2) are designed specifically for use on the Tissue-Tek Coverslipper instrument; no other baskets will fit properly onto the instrument. Each basket holds 20 slides. Replacement slide baskets are available as Product No. 4768 (10 baskets/case). A basket should be replaced if any portion of the basket is broken or if the teeth on the bottom are chipped or worn.

CARE OF THE INSTRUMENT

General Maintenance

Keep the exterior of the instrument free of dust at all times. If needed, the exterior may be cleaned using a damp cloth and a mild detergent; do not use solvents of any kind on the painted exterior parts. The glass doors may be cleaned with a glass cleaner and soft cloth.

Daily Maintenance

Waste Bottle

The waste bottle should be emptied each day and at any time during the day that it becomes full.

1. Carefully remove the waste bottle from under the waste spout (Figure 6-1). Empty the bottle before the liquid level reaches the air hole at the top of the bottle. Also, be sure the air hole is to the right before tilting the bottle from under the spout.

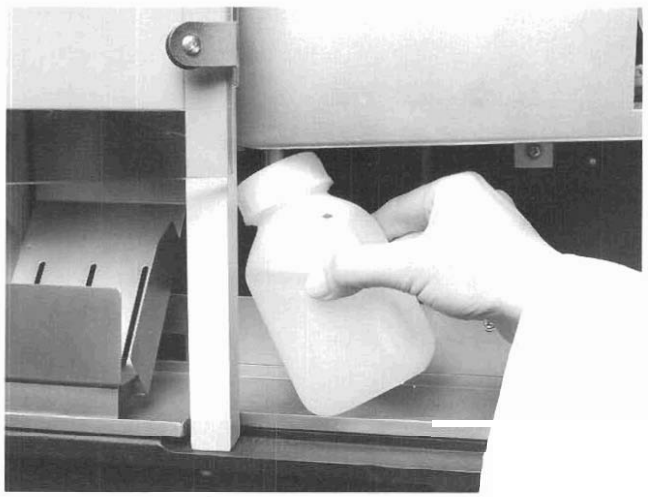


Figure 6-1

2. Empty the contents into an appropriate waste disposal container.
3. Clean the metal tray under the waste bottle and behind the loading basket drop with a paper towel to remove any spilled xylene.
4. Replace the bottle under the waste spout, with the air hole to the right.

Slide Transfer Chute

The slide transfer chute should be cleaned daily to prevent the buildup of residue from the coverslipping process, which can interfere with the transfer of coverslipped slides to the receiving basket. Moisten a paper towel with xylene and thoroughly wipe the entire length of the transfer chute, removing all residue that has accumulated (Figure 6-2).

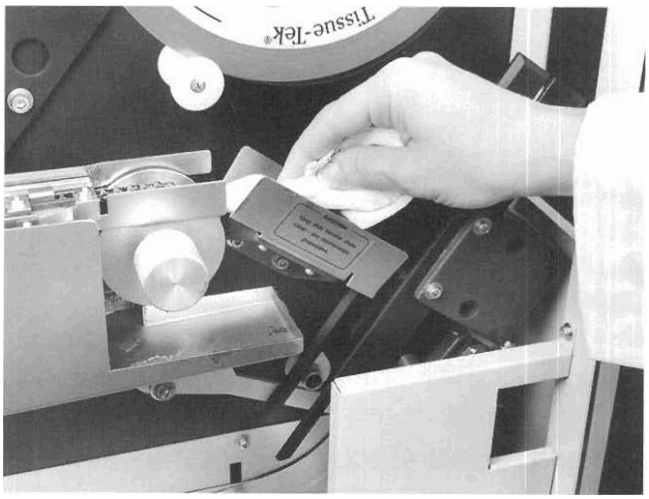


Figure 6-2

Periodic Maintenance

Filling the Xylene Bottle

Refill the xylene bottle when the reagent level drops to 250 ml to ensure a consistent xylene dispensing rate during coverslipping. Never allow the xylene Reservoir Bottle to fall below half full.

1. Unscrew the lid of the bottle by turning the bottle clockwise (Figure 6-3).

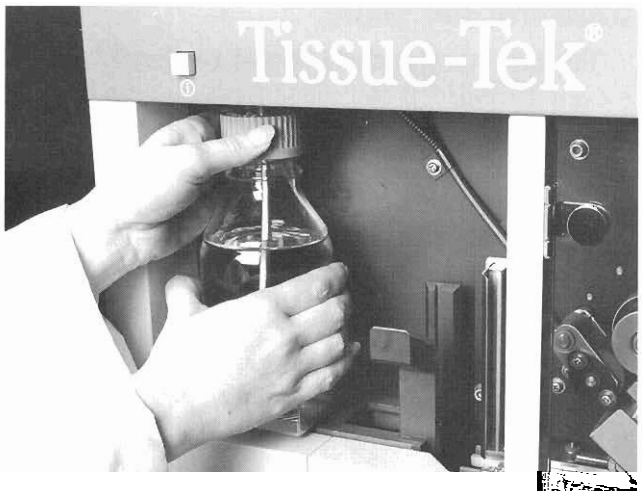


Figure 6-3

2. Remove the bottle from the platform, then fill the bottle with xylene.
3. Replace the metal tube into the bottle, place the bottle onto the platform, and tighten the cap by turning the bottle counterclockwise.

CAUTION: Do not overtighten the xylene Reservoir Bottle Cap. A snug tightness is adequate to maintain system pressure during operation. Excessive tightening can strip the cap threads, preventing closure and requiring cap replacement.

4. Purge the line to remove any air bubbles by opening the xylene flow control knob 2-3 turns and pressing the XYLENE CHECK keypad until a steady stream of xylene has been dispensed for 15-20 seconds.

   NOTE: Failure to purge the line may result in bubbles after adding xylene to the Reservoir Bottle and also may result in bubbles under the Film due to improper delivery of xylene to the slide.

5. Readjust the flow control knob to deliver the appropriate number of drops per slide by closing the control knob completely, then slowly opening it until the desired drip rate is attained.

Lubrication

Lubricate the cutter holder pin monthly or when the cutter movement becomes sluggish.

To oil the cutter holder pin (refer to Figure 6-6, Point A):

1. Hold the film cutter down.
2. Locate the spot between the blade holder and the chrome casting, opposite the pin coil spring.
3. Apply two drops of microtome oil to the cutter holder pin (at Point A), above the blade holder, opposite the pin coil spring.

- Do **not** apply excessive oil.
- Do **not** oil the cutter blade.
- Do **not** contaminate the film guide with oil
- Wipe off excessive oil with a lint-free swab
- The operator should not oil any other part of the instrument.

Film Scrap Receiver

The film scrap receiver should be emptied and cleaned at least once each month, as follows:

1. Turn the thumbscrew on the receiver tray counter-clockwise until the screw is completely free of the instrument (Figure 6-4).

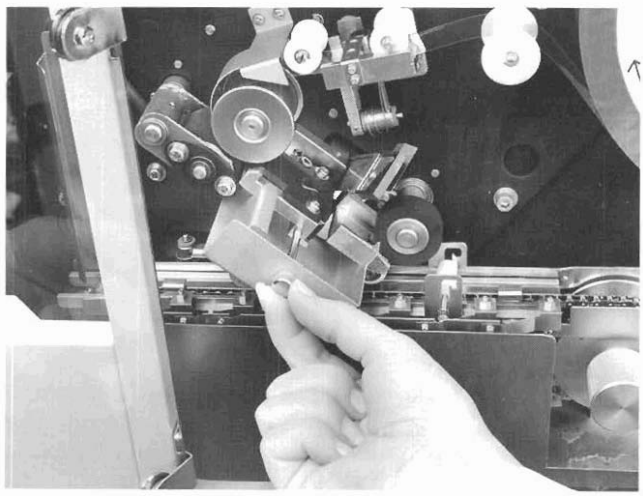


Figure 6-4

2. Remove the tray from the instrument by pulling it straight out toward you, as shown in Figure 6-5. Empty the film scraps into an appropriate container, then wipe out the tray with a paper towel.

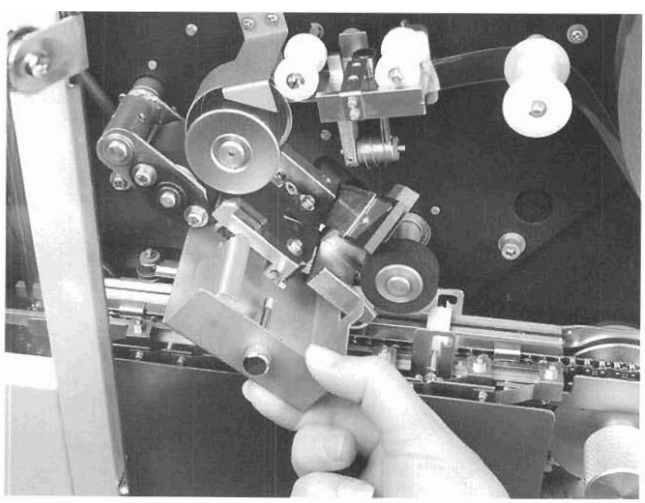


Figure 6-5

3. While the tray is removed, remove any resin dust from the rollers and blade assembly by carefully brushing with a small soft brush (such as an artist's brush) (Figure 6-6). If resin dust has accumulated and cannot be brushed away, moisten the brush with xylene and repeat. Unthread the film so the plate to the left of the blade assembly can also be cleaned. Be sure the rollers are dry before reloading the film.

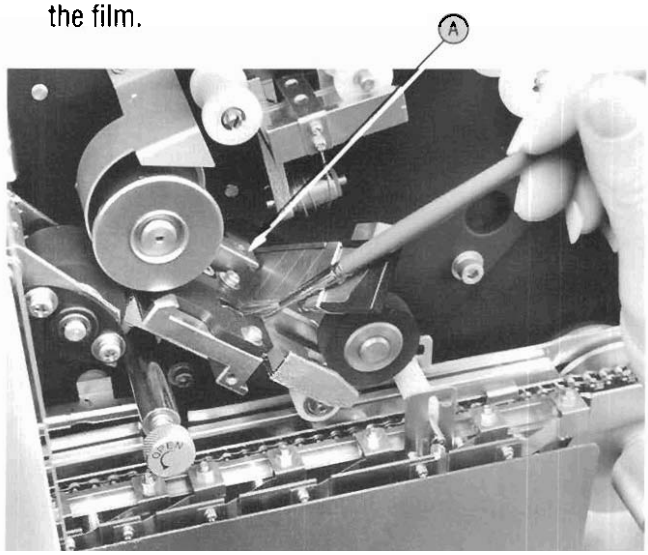


Figure 6-6

4. Replace the receiver tray onto the instrument, as follows:
   a. Line up the screw in the tray with the hole in the instrument (Figure 6-7).

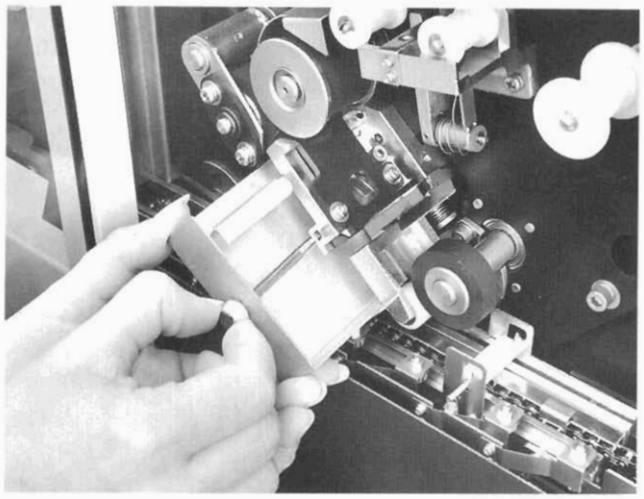


Figure 6-7

   b. Slide the tray into its appropriate position under the rollers and blade assembly and tighten the thumbscrew to just past finger tight.

   NOTE: When the receiver tray is installed correctly, the left edge of the tray *does not* contact the surface of the rollers, and the right edge fits snugly into place around the corner of the lower film guide.

Slide Baskets

After extensive use, excess resin/xylene residue may build up in the grooves of the slide basket, causing the slides to stick to the basket. This can potentially lead to two problems. Either the ejector arm is unable to dispense the slides onto the conveyor, or the slides will catch on the retaining shield in the loading channel, causing the basket to not drop properly. In both cases, the instrument will continue to run; however, no slides will be coverslipped, nor will an alarm sound.

If the baskets show signs of residue accumulation, they should be cleaned by soaking them in xylene for several hours or overnight. Gentle agitation will increase the effectiveness of the soaking. This can be easily accomplished by placing the baskets in a large beaker filled with xylene, adding a stir bar, and placing the beaker on a magnetic stirrer.

Inspect the slide baskets for wear and evidence of stress weekly. The molded plastic material will wear with normal instrument operation and show signs of stress if heated to high temperatures during slide drying procedures. Discard and replace the stressed baskets immediately to prevent slide delivery and receiving malfunctions.

CAUTION: Placing slide baskets in a microwave oven for any reason is not recommended. Doing so may damage, disfigure, and shorten the life of the baskets. Slide baskets that have been microwaved may cause operational problems when used with the Tissue-Tek® SCA™ Coverslipper.

TROUBLESHOOTING

General Information

The following Troubleshooting Chart lists possible problems related to the electrical and mechanical operations that could occur during operation of the Tissue-Tek® SCA™ Coverslipper. The chart also lists specific problems that may occur with the Tissue-Tek Coverslipping Film. Probable causes and recommended remedies are also included, so that many isolated problems can be quickly corrected. When dealing with any problem with the Coverslipper, it is essential to determine which part of the system is the source of the trouble. A systematic approach should be employed to isolate the problem.

If additional assistance is required concerning an instrument problem, or if the problem cannot be isolated or is beyond the scope of this manual, complete the "Preservice Checklist" in Section 9, SERVICE AND REPLACEMENT PARTS. Then contact the Customer Support Department, Sakura Finetek U.S.A. Inc., by calling toll free 1-800-725-8723 (U.S. only). If located outside the United States, contact the nearest Tissue-Tek instrument distributor or representative for information and assistance.

Only Tissue-Tek Coverslipping Film should be used with the Tissue-Tek SCA Coverslipper; do not use any other coverslipping film. We can only recommend the use of Tissue-Tek Coverslipping Film because of its proven performance. For problems or questions concerning the Coverslipping Film, contact the Customer Support Department.

TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE	REMEDY
Instrument fails to turn *on* when power button is pressed.	1. Power cord is not plugged into wall outlet.	1. Plug power cord in.
	2. Line fuse is blown.	2. Unplug the unit and replace the fuse (see Section 8).
	3. Fuse is blown or circuit breaker is tripped in electrical circuit of building.	3. Have fuse replaced or circuit breaker reset.
	4. Instrument electrical failure.	4. Contact Customer Support.
Indicator lamps fail to illuminate when power is turned *on*.	Instrument failure.	Contact Customer Support.
Pressurizing pump fails to come on when power is turned *on*.	Instrument failure.	Contact Customer Support.
BASKET indicator lamp is illuminated.	1. There is no receiving basket in place.	1. Place a receiving basket into the receiving channel.
	2. Receiving basket is incorrectly loaded into channel.	2. Be sure basket is properly loaded, with "UP SIDE" facing up and the basket guide pin properly inserted into the groove of the receiving channel.
	3. Defective basket.	3. Replace the basket.
	4. Basket sensor is malfunctioning.	4. Contact Customer Support.
BASKET indicator lamp is *not* illuminated when it should be (i.e., when a basket is not in place).	Basket sensor is malfunctioning.	Contact Customer Support.
FILM indicator lamp is illuminated.	1. The film roll is not loaded or is loaded incorrectly.	1. Load the film roll, ensuring it is threaded correctly.
	2. The film roll has come to an end.	2. Load a new roll of film. Be sure the film has acclimated to the laboratory conditions for at least 24 hours.
	3. The film strip is broken off the roll prior to contacting the sensor switch.	3. Remove the broken piece of film and rethread the film roll.
	4. Film sensor is malfunctioning.	4. Contact Customer Support.
FILM indicator lamp is *not* illuminated when it should be (i.e., when the film is not loaded or is at the end of the roll).	Film sensor is malfunctioning.	Contact Customer Support.
DOOR indicator lamp is illuminated.	1. One or both of the doors is open.	1. Close the doors, closing the right side first.
	2. Door did not make contact with the switch when it was closed.	2. Open both doors and reclose them, closing the right side first.
	3. Door sensor is malfunctioning.	3. Contact Customer Support.
DOOR indicator lamp is *not* illuminated when it should be (i.e., when the left door is open)	Door sensor is malfunctioning.	Contact Customer Support.

PROBLEM	POSSIBLE CAUSE	REMEDY
All indicator lamps are blinking *on* and *off* and an audible alarm is sounding.	The conveyor is jammed and not moving at its normal speed.	Turn the instrument power *off;* carefully locate and remove the object jamming the conveyor by turning the manual crank, being careful not to damage the specimen slides; restart the instrument. Refer to Section 4, "Operating Precautions," Steps 5 and 7 for complete information.
Unable to change the film length from LONG to SHORT, or vice versa.	1. Attempting to change film length while instrument is processing or during an error condition.	1. Press STOP, then change film length and restart processing.
	2. Instrument malfunction.	2. Contact Customer Support.
Conveyor does not move when START is pressed.	1. All fail-safe steps have not been taken.	1. Check the control panel for any illuminated lights (the only one should be the film length indicator). Correct the error condition and press START again.
	2. Instrument malfunction.	2. Contact Customer Support.
Slides are not properly ejected from the loading basket onto the conveyor.	1. Slides are not properly positioned in the basket.	1. Be sure each slide is in parallel, opposing grooves in the basket
	2. Basket is not properly loaded into the loading channel.	2. Remove the basket and reload, ensuring the "UP SIDE" is facing up and the basket guide pin is properly inserted into the groove of the loading channel.
	3. Glass slides are not within the size tolerances required by the instrument.	3. Be sure to use standard microscope glass slides. See allowable sizes in Section 1, "Specifications."
	4. Another slide is jammed on the conveyor.	4. Turn the instrument power *off* and remove the jammed slide. Restart the instrument. See Section 4,"Operating Precautions," Steps 5 and 7.
	5. A glass slide is adhering to the basket (e.g., gelatin or poly-L-lysine adhesives on the slide can dry and adhere the slide to the basket, or resin/xylene residues can accumulate in the basket grooves, making the slides stick).	5. Remove the basket from the loading channel, then carefully break loose the adhesion. If the basket has been used extensively, remove the accumulated residue as directed in Section 6, "Periodic Maintenance."
Basket is not dropping after each slide is ejected or received, or is dropping more than one position.	1. Defective basket.	1. Replace the basket
	2. Instrument malfunction.	2. Contact Customer Support.
Slides are not moving along the conveyor.	1. A slide is caught somewhere along the conveyor.	1. Turn the instrument power *off* and remove the jammed slide. Restart the instrument. See Section 4, "Operating Precautions," Steps 5 and 7.
	2. Instrument malfunction.	2. Contact Customer Support.

PROBLEM	POSSIBLE CAUSE	REMEDY
Xylene is not being dispensed from the xylene spout, or bubbles are being dispensed along with the xylene.	1. Xylene bottle is empty, or when it was refilled, air bubbles developed in the line.	1. Refill the bottle, replace onto instrument, and bleed the line of all air bubbles (see Section 6, "Periodic Maintenance").
	2. The volume adjusting knob is *off* (turned fully clockwise).	2. Slowly turn the knob counterclockwise (no more than a quarter turn from the fully closed position) until an appropriate volume is being dispensed.
	3. Air leakage due to: a. Loose cap on xylene bottle. b. Tube or joint leak, or defective bottle cap, air pump or valve.	3. a. Tighten the cap. b. Contact Customer Support.
	4. Improper pressure valve setting.	4. Contact Customer Support.
Xylene drips from spout when it shouldn't.	Improper pressure valve setting or defective valve.	Contact Customer Support.
Coverslipped slides are not entering the receiving basket properly.	1. Receiving basket is improperly positioned.	1. Remove the basket and place it in the receiving channel again.
	2. Defective basket.	2. Replace the basket.
	3. Slide is catching or sticking on slide transfer chute.	3. Clean the slide transfer chute with xylene (see Section 6, "Daily Maintenance").
	4. Slide being used is not within the size tolerances required by the instrument.	4. Be sure to use standard microscope glass slides. See allowable sizes in Section 1, "Specifications."
	5. Improper alignment of slide transfer chute and basket; malfunction in the receiving channel mechanics.	5. Contact Customer Support
Receiving basket does not drop automatically after it is filled.	1. Basket is defective.	1. Drop basket manually using the release lever, then replace with a new basket.
	2. Another filled basket is blocking the receiving basket drop.	2. Remove the basket (if necessary by pressing the basket release lever).
	3. Slides are longer than 3 inches (76.5 mm).	3. Be sure to use standard microscope glass slides. See allowable sizes in Section 1, "Specifications."
	4. Releasing mechanism is not working properly.	4. Contact Customer Support.
Coverslipping film is not being dispensed properly; film does not advance properly, even when FILM keypad is pressed.	1. Film is not threaded properly.	1. Turn the instrument power *off* and rewind the film onto the roll. Cut off any crimped or ragged end. Rethread in the correct manner.
	2. Film scrap receiver is contacting the film pinch roller.	2. Correctly position the film scrap receiver (see Section 6, "Periodic Maintenance").
	3. Film is heat-stressed or defective.	3. Examine the film as it unwinds from the roll to determine if the layers are sticking together. If so, contact Customer Support.
	4. Instrument malfunction.	4. Contact Customer Support.

PROBLEM	POSSIBLE CAUSE	REMEDY
Film cutter is not cutting film properly; cut edges are ragged or torn.	1. Cutter blade is dull.	1. Replace the blade, as instructed in Section 8.
	2. Blade assembly is loose or incorrectly installed.	2. Remove the blade assembly and reinstall it, as instructed in Section 8.
	3. Instrument malfunction.	3. Contact Customer Support.
Film length is longer or shorter than it should be.	1. Processing was stopped by pressing the power button rather than by pressing STOP.	1. When STOP is pressed, the film is automatically drawn up so the proper length is cut when processing begins again; this does not occur when the power is turned *off* without pressing STOP first. Cut the excess length of film before restarting the instrument if processing was stopped by pressing the power button.
	2. The wrong film length has been selected.	2. The film length defaults to "LONG" each time the instrument is turned *on*. If using "SHORT," you must press the SHORT keypad after turning the power *on*.
	3. Instrument malfunction.	3. Contact Customer Support.
Film is not being mounted in the proper position on the slide.	1. The length of the slides has changed from that to which the instrument was initially set up to use.	1. Be sure to use standard microscope glass slides. See allowable sizes in Section 1, "Specifications." The use of beveled-edge slides will also change the film placement by approximately 1 mm.
	2. Film is not advancing properly because it is heat-stressed or defective.	2. Examine the film as it unwinds from the roll to determine if the layers are sticking together. If so, contact Customer Support.
	3. Instrument malfunction	3. Contact Customer Support.
Film is not adhering properly to the slides (bubbles, edges lifting).	1. Too little xylene is being dispensed onto the slides.	1. Adjust the xylene flow control knob so that the amount of xylene dispensed is optimal for the type of specimen being coverslipped. Six to 9 drops per slide is recommended for histology and hematology specimens, 8 to 10 drops for cytology specimens.
	2. Film roll was not allowed to sufficiently acclimate to the laboratory conditions before being used.	2. It is imperative that each roll of film be allowed to acclimate for at least 24 hours to the laboratory environment. Remove the film from its box and open the bag. Store the film in the open bag, or remove from the bag and store in a cupboard protected from dust or installed (unthreaded) on the instrument.
	3. Film length selected is too long for the type of slide being used.	3. Use the SHORT length if the LONG length overlaps the frosted end of the slides, or use slides that have a narrower frosted end (such overlap can result in poor adherence).

PROBLEM	POSSIBLE CAUSE	REMEDY
Film is not adhering properly (continued)	4. Film was stored *threaded* on the instrument.	4. Cut off the portion of film that is shaped to the film threading mechanism.
	5. The film roll was loaded onto the instrument incorrectly.	5. Be sure the film is loaded so it unrolls from *underneath.* If incorrect, remove and reload.
	6. The pressure roller is not making contact with the coverslipped slide.	6. Be sure the roller is not suspended from the small catches above the conveyor.
	7. Cut edges of the film are ragged or torn.	7. Replace the cutter blade, as described in Section 8.
	8. Specimen slides have residue on the surface that is interfering with adhesion: a. from the staining or preparation procedures prior to coverslipping. b. from resin dust around the blade assembly.	8. Be sure the slides are clean and free of residue before coverslipping: a. Rinse the slides with clean xylene before processing. b. Clean the blade assembly to remove any buildup of resin dust (see Section 6, "Periodic Maintenance").
	9. Specimen is too thick or is not positioned properly on the slide.	9. Prepare another specimen sample or use a manual coverslipping method.
	10. There is excess alcohol in the final xylene rinse used during the staining procedure (prior to coverslipping). .	10. Change the xylene in the final rinse of the staining procedure daily or after every 10 baskets (depending upon use) to maintain purity.
Film is pulled up as the slide passes under the pressure roller.	The lower film advance roller is tacky because of a buildup of resin dust and xylene.	Clean the roller thoroughly with a small brush moistened with xylene and dry thoroughly (see Section 6, "Periodic Maintenance").
The coverslipped slide has a hazy or cloudy appearance.	1. A solvent other than reagent grade xylene is being used in the instrument, or the xylene is contaminated.	1. Replace the contents in the bottle with reagent grade xylene; prime the xylene line completely.
	2. The xylene used in the final rinse of the staining procedure (prior to coverslipping) has become contaminated.	2. Use reagent grade xylene in the final rinse and replace it at least once each day to maintain purity.

MINOR REPAIRS

This section is provided as an aid in performing minor repairs and maintenance procedures on the Tissue-Tek® SCA™ Coverslipper. The procedures must be completely understood before being attempted and then performed with care. For any repairs other than those given in this section, or if any procedure appears to be too complex, refer to Section 9, SERVICE AND REPLACEMENT PARTS, for instructions on service for your instrument.

Fuse Replacement

Tools Required:

None

Parts Required:

Instrument Line Fuse–

Model 4764–2.0 amp, 250 volt, Time Delay,
(Part No. A3-40-0450)
Dia. 5 x 20mm, LF #239002,
115 VAC/ 60 Hz–1 per unit.

*Model 4765–2.0 amp, 250 volt, Time Lag,
(Part No. A3-40-0362)
Dia. 5 x 20mm, ES3-2000,
220 VAC/ 50 Hz–2 per unit
240 VAC/ 50 Hz–1 per unit.

Procedure:

1. The Coverslipper contains one fuse in Model 4764 (115 VAC) and model 4765 (240 VAC). Two fuses are used in model 4765 (220 VAC). These fuses may need to be replaced. Figure 8-1 shows the location of the instrument line fuse(s).

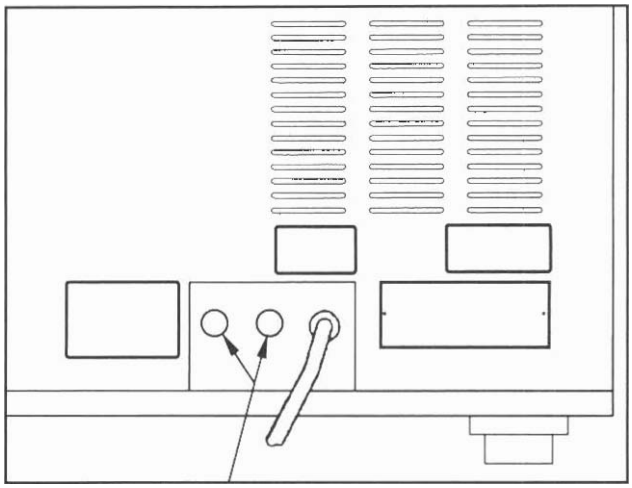


Figure 8-1

2. **WARNING: TURN THE INSTRUMENT *OFF* AND REMOVE THE AC ELECTRICAL CORD FROM THE WALL OUTLET BEFORE REPLACING THE FUSE.**
3. Remove the fuse by pressing in on the fuse cap and turning counterclockwise. Pull the fuse out of the cap and discard.
4. Replace the defective fuse with an identical type fuse listed previously. Place one end of the new fuse into the fuse cap, then insert the fuse and cap into the fuse holder. Press in on the cap and turn clockwise to lock into place.

   CAUTION: Use fuse of specified type and amperage rating only. If a new fuse blows again shortly after replacement, the instrument may have an electrical short; contact Customer Support immediately.

*For instruments located outside the United States, contact your local distributor for the appropriate fuse.

Blade Replacement

Tools Required:

None

Parts Required:

Tissue-Tek Coverslipper Blade (Product No. 4772)

Procedure:

CAUTION: Use caution when handling the blades; even used blades are still sharp.

1. **WARNING: TURN THE INSTRUMENT *OFF* AND REMOVE THE AC ELECTRICAL CORD FROM THE WALL OUTLET BEFORE REPLACING BLADE.**
2. Pull the spring steel tab on the blade assembly to the right to clear the capture button on the black safety handle (Figure 8-2).

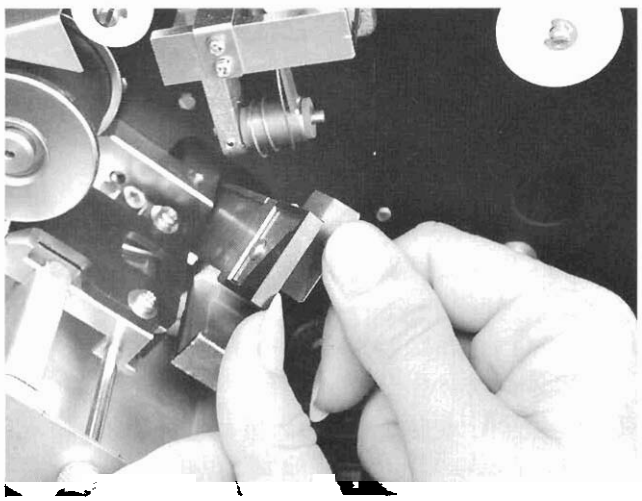


Figure 8-2

The handle, along with the blade, can then be removed from the assembly by pulling it straight out. While removing, hold the blade against the safety handle, as it is not locked into place on the handle (Figure 8-3).

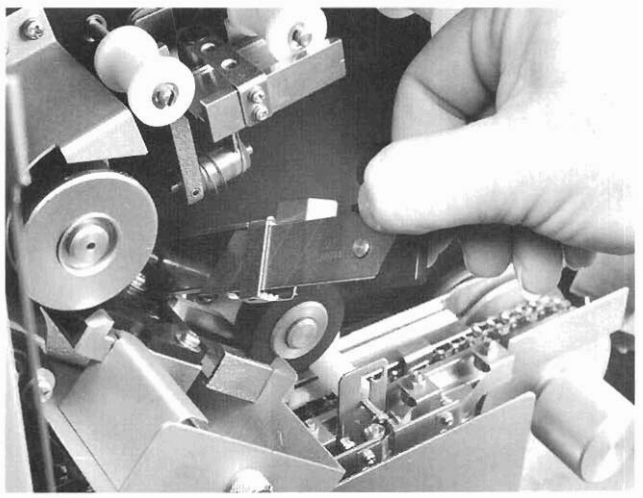


Figure 8-3

3. Lift the used blade off the safety handle and dispose of in an appropriate container.

4. Insert a new blade into the recessed area of the safety handle by aligning the hole in the blade to the peg on the handle (Figure 8-4). Notice the blade fits into the handle in only one direction.

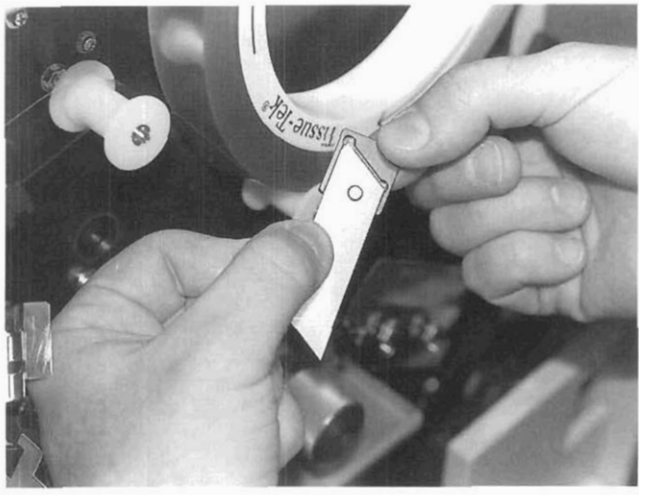


Figure 8-4

5. Holding the blade against the safety handle, carefully insert the blade into the slit of the guide piece on the blade assembly. Push the blade completely in without dragging the sharp edge of the blade along the guide piece. The black safety handle must be seated flush against the guide piece when the assembly is fully and correctly inserted. If resistance is encountered prior to this point, carefully use one finger of the opposite hand to press against the body of the blade (near the tip) while continuing to push the assembly in with the other hand (Figure 8-5).

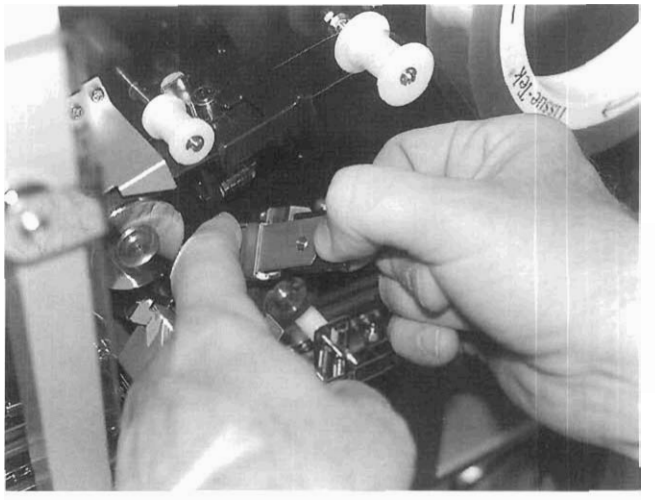


Figure 8-5

6. When the blade is fully inserted, press the spring tab over the capture button on the safety handle. Pull firmly out on the safety handle to ensure it is seated securely in place.

SERVICE AND REPLACEMENT PARTS

Service Information

When You Have a Problem With the System

When problems arise during operation of the Tissue-Tek® SCA™ Coverslipper, first refer to Section 7, TROUBLESHOOTING. Avoid problems by carefully following proper operating and cleaning procedures. Be sure to allow the Tissue-Tek Coverslipping Film to acclimate to the laboratory conditions for at least 24 hours before use; failure to do so may result in bubbles and/or poor adherence of the film to the slide.

- If the problem cannot be solved and an instrument failure is apparent—
- If the problem centers on the Tissue-Tek Coverslipping Film—

Our Customer Support Department is available to assist you.

Before calling for instrument service, collect the information requested in the "Preservice Checklist." This information will help the Customer Support Representative to identify the probable cause of your instrument malfunction.

Where to Call for Service

If located within the United States, contact the Customer Support Department of Sakura Finetek U.S.A. Inc. by calling toll free:

1-800-725-8723

In countries other than the United States, contact the nearest authorized Tissue-Tek instrument distributor or representative for service information and assistance.

Tissue-Tek SCA Coverslipper Preservice Checklist

For reference, record the following information:

Serial Number _____

Model Number _____

Installation Date _____

1. Has Section 7, TROUBLESHOOTING, been reviewed? ☐ YES ☐ NO
2. When the power is turned *on*, do all the control panel lights illuminate and does the pressurizing pump come on? ☐ YES ☐ NO
   If NO:
   - Is the unit plugged into a live AC electrical outlet? ☐ YES ☐ NO
   - Has the line fuse been checked and replaced if defective? ☐ YES ☐ NO
3. Are all the indicator lights (except the film length) *off* before pressing START? ☐ YES ☐ NO
4. Is the xylene bottle full and has all air been removed from the tubing? ☐ YES ☐ NO
5. Is the desired volume of xylene being consistently dispensed? ☐ YES ☐ NO
6. Have the daily and periodic maintenance procedures been performed? (See Section 6.) ☐ YES ☐ NO
7. Has the instrument been moved recently? ☐ YES ☐ NO
8. Has the instrument or laboratory been subjected to any power outages, surges, or brownout conditions? ☐ YES ☐ NO
9. Are there any visible imperfections or anomalies apparent on the roll of film? ☐ YES ☐ NO
10. Was the film roll allowed to acclimate to the *laboratory conditions* for at least 24 hours prior to use? ☐ YES ☐ NO
11. List the lot number and expiration date of the film being used.
    Lot No. _____ Exp. Date _____
12. How often has the problem occurred? _____

_____

_____

_____

_____

Replacement Parts and Accessories

Replacement Accessory Items

Product No.	Description
4770	Tissue-Tek Coverslipping Film each
4772	Tissue-Tek Coverslipper Blades (5 blades)
4768	Tissue-Tek Coverslipper Slide Baskets (10 baskets)

2209 Basket Hooks

Replacement Parts

Part No.	Description
A3-40-0385	Line Fuse–2.0 Amp, 250 volt, Time Delay, Dia. 5 x 20mm, LF #239002 For Model 4764, 115 VAC/ 60 Hz, 1 per Unit.
A3-40-0362	Line Fuse–2.0 Amp, 250 volt, Time Lag, Dia. 5 x 20mm, ES3-2000 For Model 4765, 220 VAC/ 50 Hz, 2 per Unit. For Model 4765, 240 VAC/ 50 Hz, 1 per Unit.
B4-00-0320	Xylene Bottle (500 mL, glass)
B4-01-0180	Waste Bottle (250 mL, polyethylene)
99947648	Tissue-Tek SCA Coverslipper Service Manual

Where to Order:

In the United States, the above Accessory Items and Replacement Parts may be ordered directly from:

Sakura Finetek U.S.A., Inc.
Order Services
18700 Crenshaw Boulevard
Torrance, CA 90504

or by calling toll free:

1-800-725-8723

Outside of the United States, contact the nearest authorized Tissue-Tek distributor.