SOP on Automated Tissue Processor

Department of Anatomy

Faculty of Medicine

UWUSL

Standard Operating Procedure (SOP) on
Automated Tissue Processor

Issued By,

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Purpose

To provide a standardized procedure for processing tissue specimens using an automated tissue processor to ensure optimal dehydration, clearing, and paraffin infiltration while preserving tissue morphology for histological examination.

Scope

This SOP applies to all laboratory personnel responsible for histopathological tissue processing in the Anatomy/Histopathology laboratory.

Responsibilities

• Laboratory Technologists: Operate the tissue processor according to this SOP.
• Laboratory In-charge: Ensure maintenance, reagent quality, and staff training.
• Quality Officer: Monitor compliance with the SOP.

Principle

The automated tissue processor sequentially transfers fixed tissue specimens through graded alcohols for dehydration, clearing agents (e.g., xylene), and molten paraffin wax. This process prepares tissues for embedding and sectioning.

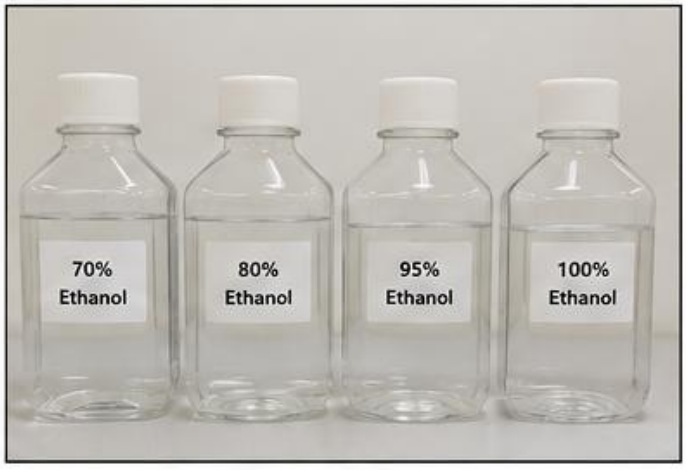
Materials and Equipment

- Automated tissue processor

- Tissue cassettes

- 10% Neutral Buffered Formalin-fixed tissue specimens

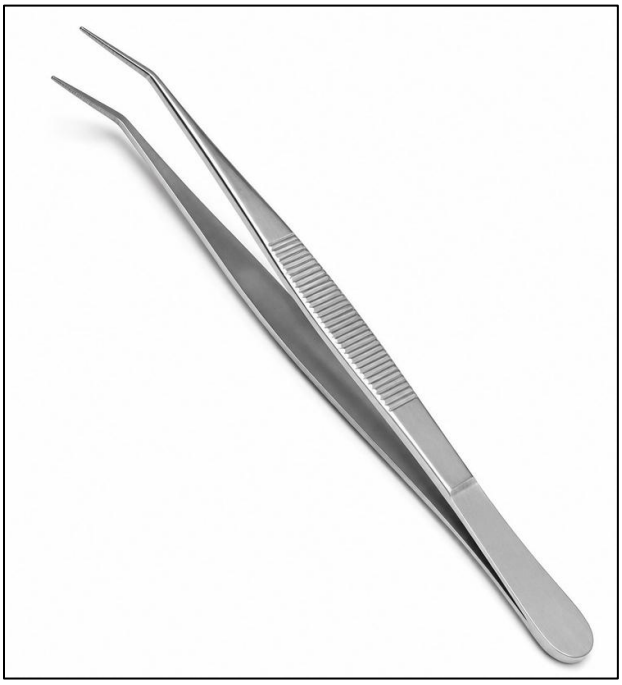
- Graded ethanol (70%, 80%, 95%, Absolute I, Absolute II)



- Xylene or xylene substitute

- Paraffin wax (58–60°C)

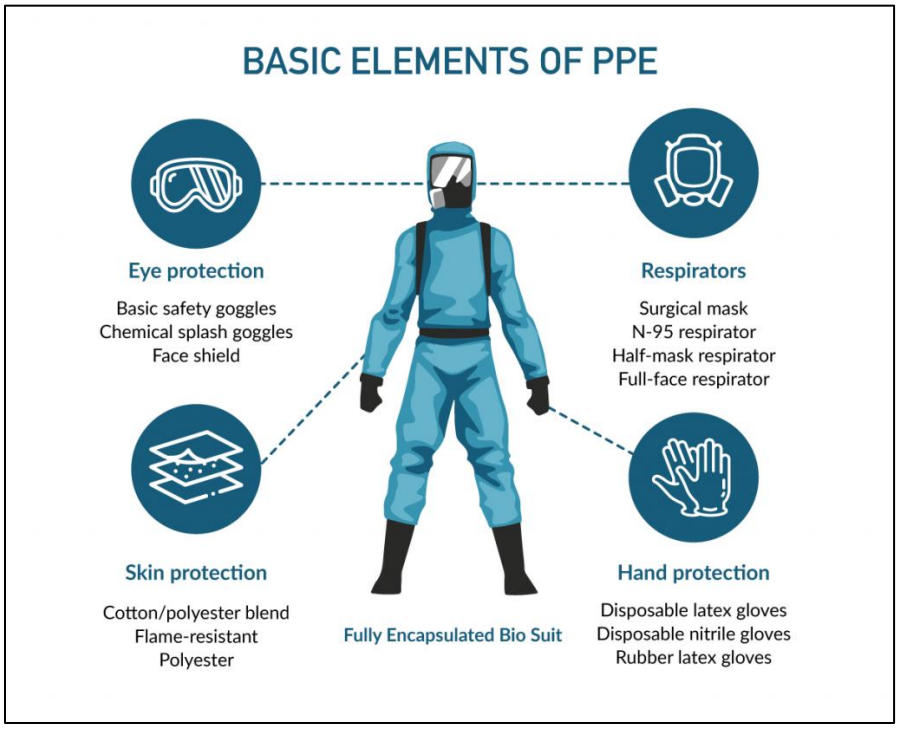
- Forceps



- Gloves

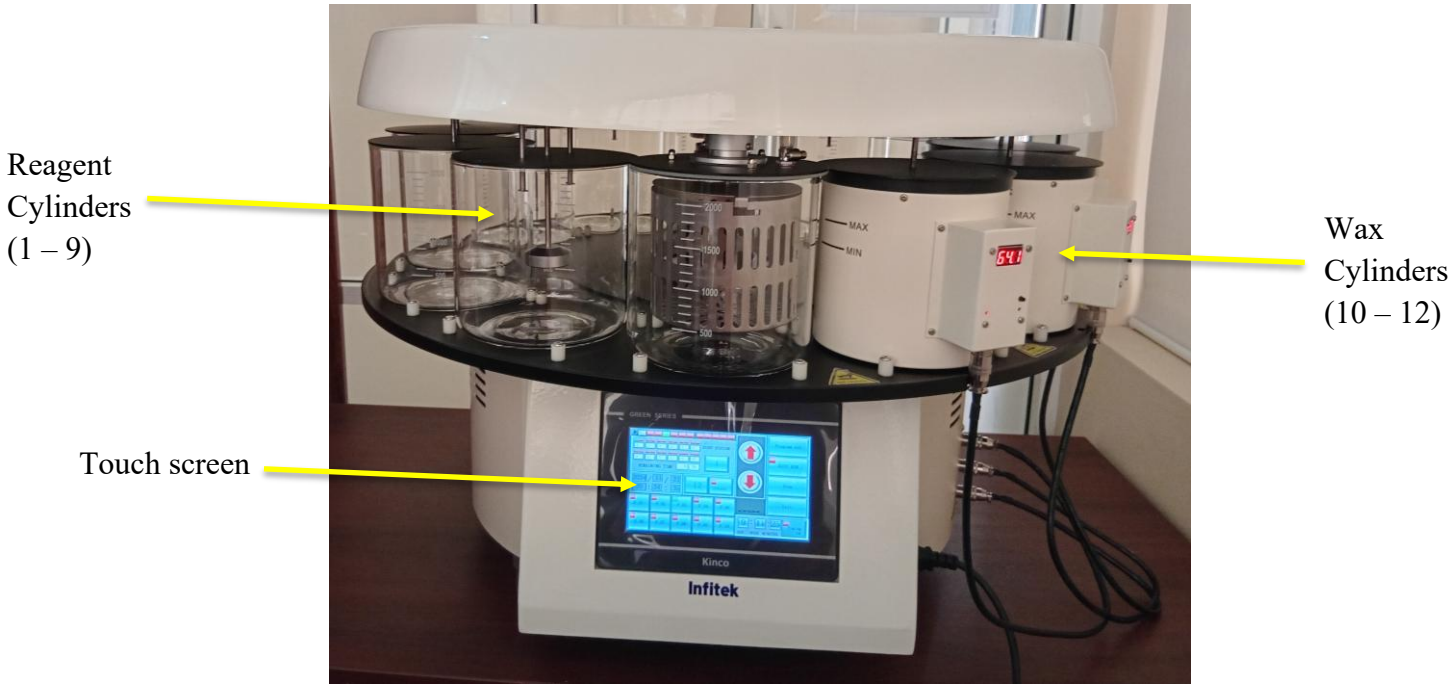
Safety Precautions

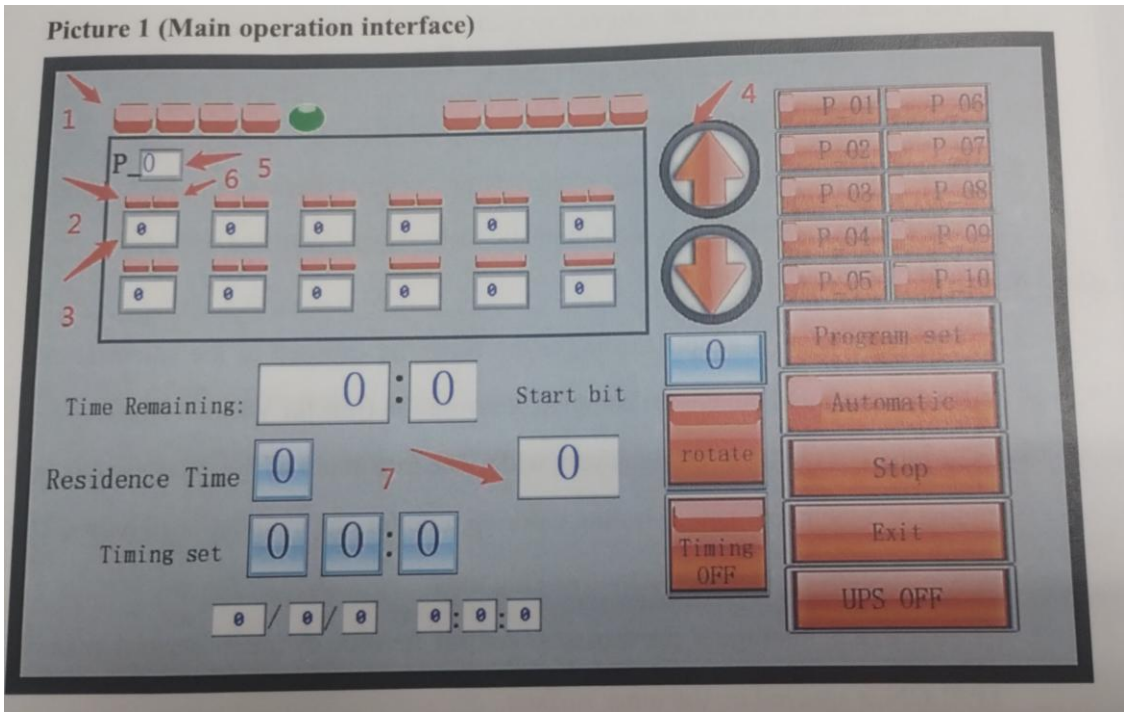
- Wear PPE.



- Handle alcohol/xylene in ventilated area.
- Avoid inhalation.
- Do not operate with wet hands.
- Ensure electrical safety.
- Dispose chemicals properly.
- Report spills.

Parts of the Automated Tissue Processor





1. Indicator light
(From left to right: Lower limit indicator lamp, Upper limit indicator lamp, Rotary cylinder indicator lamp, indicator lamp, Timing start indicator lamp, Power failure indicator lamp (with UPS), Rise indicator lamp, Drop indicator lamp, Rotating cylinder motor indicator lamp, Vacuum indicator lamp, Mixing indicator lamp.

2. Cylinder position indicator lamp: The lamp shows green when it runs to a certain cylinder.

3. Working hours of current working cylinder(min)

4. Manual lifting button: Manual lifting tissue basket.

5. Program number: Display the program number of the selection.

6. Instant cylinder (The cylinder position can be adjusted here).

7. Program storage area: There are ten sets of reserved programs that can be set here,respectively P-1 to P-10. It can be saved in accordance with the actual situation.Program settings key: When you press this button, enter the program default interface.

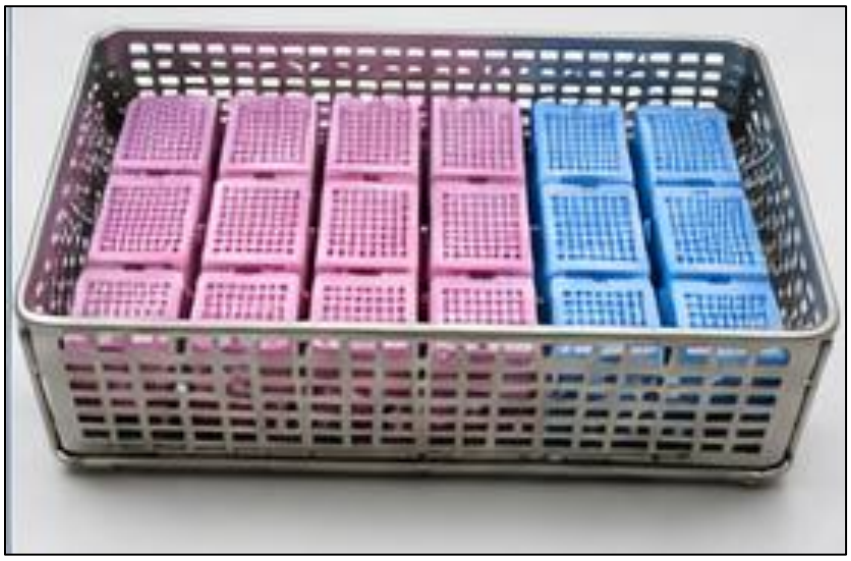
Procedure

(A) Preparation

- Verify that tissues have been adequately fixed (minimum 24 hours in 10% neutral buffered formalin unless otherwise specified).
- Ensure tissues are placed in properly labeled tissue cassettes.
- Check that reagent levels are adequate.
- Verify the paraffin temperature (58–60°C).
- Inspect the processor for cleanliness and proper functioning.

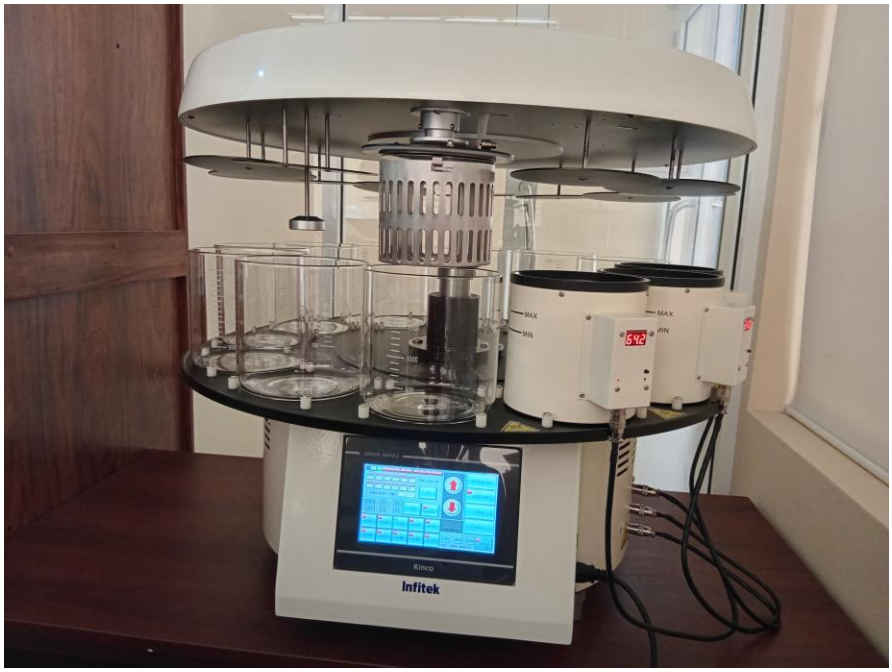
(B) Loading the Samples

- Arrange tissue cassettes securely in the specimen basket.



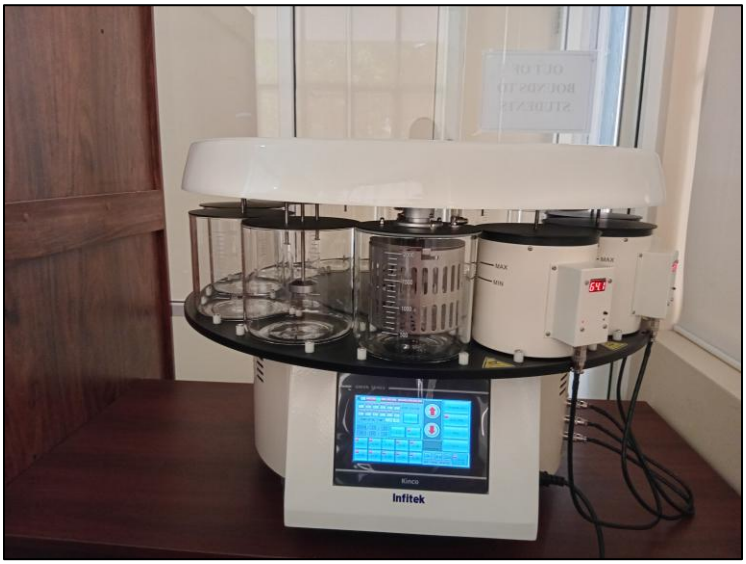
- Ensure cassette lids are tightly closed.

- Lift the head of the tissue processor.



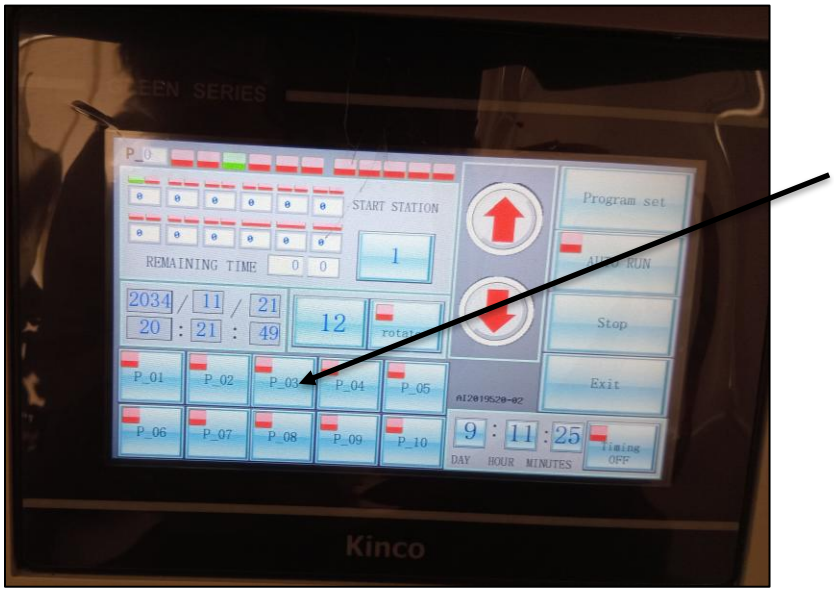
- Place the basket inside the tissue processor.

- Close and secure the processor lid.



(C) Selecting the Processing Program

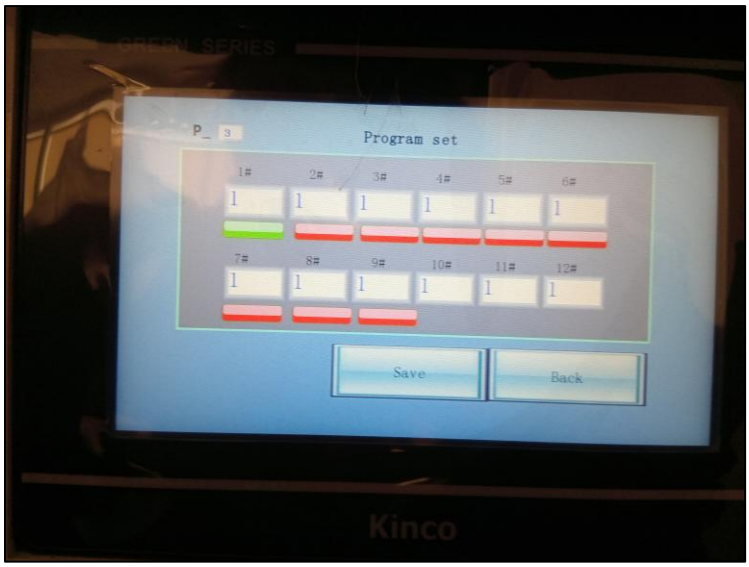
- Choose the appropriate program depending on tissue type.



- Select the time appropriately by relevant box. If you want to skip one, keep it zero.

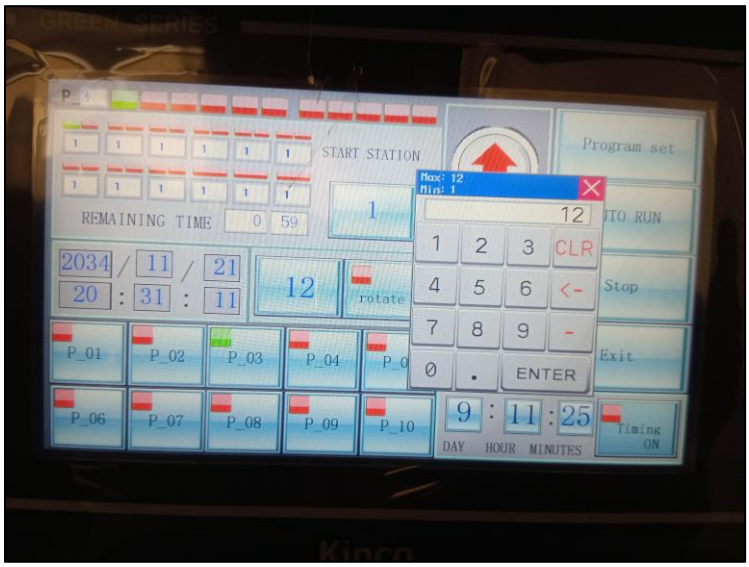
Step	Reagent	Time
	70% Ethanol	30 min
	70% Ethanol	30 min
2	80% Ethanol	30 min
	80% Ethanol	30 min
3	95% Ethanol	30 min
	95% Ethanol	30 min
4	Absolute Ethanol I	30 min
5	Absolute Ethanol II	30 min
6	Xylene I	30 min
7	Xylene II	30 min
8	Paraffin Wax I	1.5 hours
9	Paraffin Wax II	1.5 hours

- If you need the vacuum suck option, can tap on the red square on the screen below the relevant chamber and make them green in colour.



(D) Running the Processor

- Can change the starting station from this menu.



- Confirm all settings.
- Press Start.

- Allow the processor to complete the cycle without interruption.
- Monitor for any alarms or error messages.

(E) Completion of Processing

- When processing is complete, open the lid carefully.
- Remove the tissue basket.
- Transfer cassettes immediately to the embedding station.
- Record completion in the processing logbook.

Quality Control

- Check reagent clarity.
- Replace exhausted reagents.
- Monitor paraffin temperature
- Verify timing.
- Record maintenance.
- Process control tissue.

Cleaning and Maintenance

Daily

- Clean surfaces.
- Remove wax.
- Inspect reagents.

Weekly

- Inspect reagent containers.
- Clean basket and chamber.
- Check paraffin containers.

Monthly

- Replace reagents as per laboratory schedule.
- Inspect seals, hoses, and electrical components.
- Perform preventive maintenance according to the manufacturer's

Troubleshooting

Problem	Possible Cause	Corrective Action
Poor tissue infiltration.	Old paraffin.	Replace paraffin.
Soft tissue after processing.	Incomplete dehydration.	Replace alcohol and repeat processing.
Brittle tissue.	Over-dehydration.	Reduce alcohol exposure time.
Residual xylene odor.	Incomplete paraffin infiltration.	Increase paraffin infiltration time.
Processor alarm.	Mechanical fault or low reagent level.	Refer to manufacturer's manual and notify maintenance.

Waste Disposal

- Dispose of used alcohol and xylene according to institutional hazardous waste protocols.
- Do not pour solvents into sinks.
- Collect chemical waste in designated containers.
- Dispose of tissue waste as biomedical waste.

Documentation

Record the following:

- Date
- Operator name
- Batch number
- Processing program used
- Reagent replacement dates
- Maintenance performed
- Any deviations or corrective actions

Acceptance Criteria

The processed tissue should:

- Be firm but not brittle.
- Show complete paraffin infiltration.
- Be free from residual clearing agent.
- Produce smooth sections during microtomy.
- Demonstrate good staining quality after sectioning.

References

1. Bancroft JD, Gamble M. *Bancroft's Theory and Practice of Histological Techniques*. 9th Edition. Elsevier.
2. Kiernan JA. *Histological and Histochemical Methods: Theory and Practice*. 5th Edition.
3. WHO Laboratory Quality Management System Handbook.

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