

**Frederick National Laboratory
for Cancer Research**

sponsored by the National Cancer Institute

Vaccine, Immunity and Cancer Directorate
Standard Operating Procedure

SOP Title: Use and Maintenance of the Water Bath

Document ID: 26007

Version

2.0

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Supersedes

1.0

Effective Date: 07Sep21

Test1234!@#

Written by:

Printed Name:	Title:	Signature/Date:

Approved by:

Printed Name:	Title:	Signature/Date:

QA Approved by:

Printed Name:	Title:	Signature/Date:

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1. PURPOSE

- 1.1. The purpose of this procedure is to describe the proper use and handling of the Water Bath.

2. SCOPE

- 2.1. This procedure applies to all Water Baths.

3. REFERENCES

- 3.1. Fisher Scientific Isotemp GDP10 Water Bath User Manual
- 3.2. 10007: Non-Routine Equipment Maintenance
- 3.3. 10009: General Record Review
- 3.4. 15000: Waste Disposal at the Advanced Technology Research Facility
- 3.5. 26016: Operation, Use and Maintenance of the Water Purification Systems

4. RESPONSIBILITIES

- 4.1. The Research Associate, hereafter referred to as Analyst, is responsible for reviewing and following this procedure, and documenting performance of equipment maintenance.
- 4.2. The Scientific Manager or designee is responsible for training personnel in this procedure and reviewing associated documentation.
- 4.3. The Quality Assurance Specialist is responsible for quality oversight and approval of this procedure.
- 4.4. Trained personnel perform equipment maintenance record review per "10009: General Record Review."

5. DEFINITIONS

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- 5.1. As Needed Maintenance – maintenance that is performed outside of routine maintenance but is not performed in response to equipment malfunction.
- 5.2. Routine Maintenance – maintenance that is performed at planned intervals to identify and prevent problems before they result in equipment failure.
- 5.3. Non-Routine Maintenance – maintenance that is performed in response to equipment malfunction or failure.
- 5.4. Type II Water – Pure/Analytical Grade, used for standard applications (Resistivity >1 MΩ-cm and TOC ≤ 50 ppb)

6. REAGENTS, MATERIALS AND EQUIPMENT

- 6.1. Algaecide, Clear Bath (VWR, Cat # 54847-540 or equivalent Water Conditioner)
- 6.2. Detergent Concentrate, PCC-54 (ThermoFisher Scientific, Cat # PI72288 or equivalent)
- 6.3. Primary Disinfectant (Cavicide, FNLCR Warehouse, Cat # 79300360 or equivalent)
- 6.4. Secondary Disinfectant (Ster-ahol, VWR, Cat # 14003-358 or equivalent)
- 6.5. Thermometer, NIST Traceable (VWR, Cat # 89095-640 or equivalent)
- 6.6. Water, Type II
- 6.7. Water Bath
- 6.8. Wipe, Low-Lint, Wypalls (FNLCR Warehouse, Cat # 79300335 or equivalent)

7. HEALTH AND SAFETY CONSIDERATIONS

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- 7.1. Proper safety precautions should be taken while working in a laboratory setting. This includes, but is not limited to, proper protective equipment such as lab coats, safety glasses, closed-toe shoes, and non-latex gloves.
- 7.2. Refer to the respective Safety Data Sheet (SDS) when working with any chemicals.
- 7.3. Refer to 15000: Waste Disposal at the Advanced Technology Research Facility” regarding waste disposal processes at the Advanced Technology Research Facility (ATRF).
- 7.4. Never operate the Water Bath with a damaged Electrical Cord or Plug.
- 7.5. Ensure the Electrical Cord is connected to a properly grounded outlet.
- 7.6. Do not allow the Water Bath Electrical Cord or Plug to come in contact with the reservoir contents or other liquids.
- 7.7. Do not locate the Water Bath where excessive heat, moisture, flammable, or corrosive materials are present. Do not use flammable liquid to fill the Water Bath.
- 7.8. Turn the Water Bath off and unplug before cleaning, moving, or performing maintenance on the Water Bath.
- 7.9. Do not touch Cover surface when operating the Water Bath at high temperatures; always use the cover’s handle.
- 7.10. Do not place any containers directly on the bottom of the Reservoir; always use the Diffuser Tray.
- 7.11. The Water Bath creates steam when the unit is used at $\geq 80^{\circ}\text{C}$. Use care when removing Cover and handling samples/materials.
- 7.12. Monitor fluid level whenever heating Reservoir and refill with Type II Water, as needed. Tap water is listed for use in User Manual however Scientific Manager approved use of Type II Water due to local tap water quality.
- 7.13. Stainless steel can and will rust if not regularly cleaned and properly maintained; do not scrub any surface with steel wool. See User Manual for guidance.
- 7.14.

8. EQUIPMENT USE

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8.1. Water Bath Set Up

8.1.1. Verify the Water Bath Reservoir has been cleaned after last use. Clean Water Bath per Section 9 if needed.

8.1.2. Ensure the Reservoir Drain Port is closed, that all plumbing connections are secured, place the Diffuser Tray on the bottom of the Reservoir, and plug the Water Bath in.

8.1.3. Fill Water Bath slowly with Type II Water. The minimum liquid level is at least 1½ inches from the bottom of the tank with the Diffuser Tray installed. The maximum liquid level is no more than an estimated one inch below Tank's upper surface. If racks, samples, reagents are added and the liquid level is too high, remove water first so the Water Bath does not overflow.

8.1.4. Use Clip provided to hold Thermometer to the front of the Water Bath along the center of the front edge. A notch along the front of the Cover allows space for the Thermometer and Clip when the Cover is closed. Slide the O-ring on the Thermometer in order to position the Thermometer near the center of the liquid level.

8.1.5. Algaecide, such as Polyclean Clarifier, should be added to reduce algae formation. Follow the instructions supplied with the algaecide and record lot number on "26007-01: Monthly Maintenance Form."

8.1.6. Record Fill activity on 26007-01 form.

8.2. Powering on Water Bath

8.2.1. Set Power Switch to ON position. The Water Bath goes through a power-on self-test that takes several seconds. During this time the Display shows the unit's capacity in liters.

8.2.2. When Water Bath has completed its self-test, it maintains the water temperature at the last set-point. The Heat Indicator lights when the unit is applying heat to the Water Bath. This indicator cycles on and off during normal operation.

8.2.3. When the self-test is complete and the Display shows normal operation, continue by setting the temperature set-point and backup temperature per section 8.3.

8.2.3.1. If Display shows any error message after completing the self-test, do not use Water Bath. Refer to the Troubleshooting section of the user manual to determine cause.

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8.3. Setting Temperature Set-Point

8.3.1. Verify temperature is displayed as °C (Centigrade) on the left of the Display.
Change temperature unit when °F (Fahrenheit) is displayed.

8.3.1.1. Press the Menu Button so Display shows _°C_°F.

8.3.1.2. Press and hold Set Button while simultaneously pressing the Increase (Λ) or Decrease (V) button until Display shows the temperature unit in °C.

8.3.1.3. Release all controls. Within a few seconds the Display returns to normal operation. Temperature unit °C should be on the left of the display.

8.3.2. Change Temperature Set-Point, as Needed.

8.3.2.1. From the home screen, press the Increase (Λ) or Decrease (V) Button. Display shows the temperature set-point.

8.3.2.2. Select Button below the check mark (✓) to save the change.
Select Button below the (X) to not save the change.

8.3.2.3. Display returns to normal operation within a few seconds, displaying the actual temperature. To check the set-point without affecting normal operation, press the Set Button at any time.

8.3.2.4. When temperature Display reaches new set-point, Water Bath is ready for use.

8.4. The same fluid level should be maintained in Water Bath while in use. Add Type II Water as needed.

Note: Closely monitor fluid level when Water Bath temperature is set to ≥80°C; frequent top-offs are required.

9. MAINTENANCE

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9.1. Monthly Maintenance

Note: Monthly cleaning is performed once a month but may be performed as needed.

9.1.1.1. Document Unscheduled Maintenance in its respective section on form 26007-01.

9.1.2. Turn off power, unplug Water Bath, and allow to cool to at least 37°C.

9.1.3. Use internal Drain System (hose and connector) to empty Water Bath Reservoir into the sink if equipped; otherwise, use transfer pump.

Note: In instances where heavy residues are observed inside Reservoir, clean with mild detergent and warm tap water prior to step 9.1.4.

9.1.4. Spray Water Bath with Cavicide and let sit for at least 3 minutes prior to being wiped with clean low-lint wipe.

9.1.5. Spray Ster-ahol on clean low-lint wipe and wipe unit.

9.1.6. Return Water Bath to use according to Section 8.

9.1.7. Document maintenance performed on 26007-01.

9.2. As Needed Maintenance

9.2.1. Additional maintenance, such as removing corrosion from inside tank of water bath (See User Manual,) may be performed outside of typical maintenance schedules.

9.2.2. Record maintenance on 26007-01.

9.3. Non-Routine Maintenance

9.3.1. In the case that the Water Bath is not operating correctly, transition processes being performed to another unit (when applicable), post a sign stating the equipment is out of service and initiate non-routine maintenance documentation per "10007: Non-Routine Equipment Maintenance."

9.3.2. Document the nature of any failures or malfunctions, how and when it was discovered, and the personnel involved on "10007-01: Non-Routine Equipment Maintenance Form."

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9.3.3. Initiate a service request and complete the Non-Routine Maintenance process following 10007.

9.4. Annual Calibration

9.4.1. Facilities, Maintenance, and Engineering (FME) or a contracted vendor calibrate Water Bath every year as required, for routine use.

9.4.2. Water Baths are assessed for recalibration after repair, damage, or if physical, or electronic changes occur that could impact the operation, range, accuracy, or tolerance of the equipment. This is determined by the Scientific Manager or designee.

9.4.3. Print the calibration report and file.

10. ATTACHMENTS

10.1. Attachment 1: 26007-01: Monthly Maintenance For

11. REVISION HISTORY

Version	Change	Reason
1.0	Create new SOP for the use and maintenance of the fisher scientific Isotemp GDP10 Water Bath	Currently no SOP.
2.0	<ol style="list-style-type: none">1. Update Maintenance to include As Needed and Non-Routine.2. Clarified use of Water Bath.3. Updated Maintenance Form to include Monthly Maintenance4. Updated Responsibilities Section5. Updated Reference Section6. Minor grammar and language change	<ol style="list-style-type: none">1. New guidance.2. To closer align with User Manual.3. New guidance4. New guidance

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Attachment 1: 26007-01: Monthly Maintenance Form

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Form Title: Monthly Maintenance Form				
Document ID: 26007-01		Version:		2.0
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Equipment ID:			Maintenance Year (YYYY)	
Date	Initials	Reviewed by/date	Activity Performed	
			<input type="checkbox"/> Fill, Algaeicide Lot #:	<input type="checkbox"/> Monthly Maintenance Cavicide, Lot #: Ster-ahol, Lot #: <input type="checkbox"/> Recalibration
			<input type="checkbox"/> Fill, Algaeicide Lot #:	<input type="checkbox"/> Monthly Maintenance Cavicide, Lot #: Ster-ahol, Lot #: <input type="checkbox"/> Recalibration
			<input type="checkbox"/> Fill, Algaeicide Lot #:	<input type="checkbox"/> Monthly Maintenance Cavicide, Lot #: Ster-ahol, Lot #: <input type="checkbox"/> Recalibration
			<input type="checkbox"/> Fill, Algaeicide Lot #:	<input type="checkbox"/> Monthly Maintenance Cavicide, Lot #: Ster-ahol, Lot #: <input type="checkbox"/> Recalibration
			<input type="checkbox"/> Fill, Algaeicide Lot #:	<input type="checkbox"/> Monthly Maintenance Cavicide, Lot #: Ster-ahol, Lot #: <input type="checkbox"/> Recalibration
			<input type="checkbox"/> Fill, Algaeicide Lot #:	<input type="checkbox"/> Monthly Maintenance Cavicide, Lot #: Ster-ahol, Lot #: <input type="checkbox"/> Recalibration

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As Needed Maintenance: ☐ N/A

Date	Activity Performed	Recorded by/date	Reviewed by/date
<input type="checkbox"/> N/A			
<input type="checkbox"/> N/A			

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