RUTGERS UNIVERSITY Office for Research	RUAC STANDARD OPERATING PROCEDURE	
TITLE: Operation and Maintenance of Rack Washer, Bottle Washer, Autoclaves and Garbel		
SOP Category: Facilities	**RUAC SOP #: 2.22**	**Page: 1 of 22**
Effective Date: 8/20/2021	**Approval:** Lisa Antonucci	
Revisions: 3/18/25		

SCOPE:

This SOP covers the operation of the following ICPH (PHRI and RBL) cage wash equipment:

Bottle washer
Rack washers
Garbel
Autoclaves

OBJECTIVE:

This document establishes the procedures for operation of the cage wash equipment and autoclaves at International Center of Public Health (ICPH), Public Health Research Institute (PHRI) and Regional Biocontainment Laboratories (RBL).

PROCEDURE:

PHRI Rack Washer – PHRI Rack washer is MTP 2100 Cage, Rack and Utensil Washer. The rack washer is primarily used for washing rabbit racks, rabbit pans, carts and larger items. The rack washer can also be used for washing rodent caging shoebox bottoms, wire bars, rodent caging shoebox tops, rabbit floors and water bottles by using a special rack made for washing those items in the rack washer. The rack washer is a contained washer that has a mechanical arm that moves over the items being washed. Each cycle washes with a pre-rinse, wash, final rinse and drying. It also only has one door to load and unload equipment from.

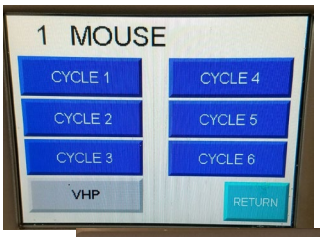
Do not operate the rack cage washer until you have received training in the operation of the washer, and the safety features specific to the machine. Training covers:

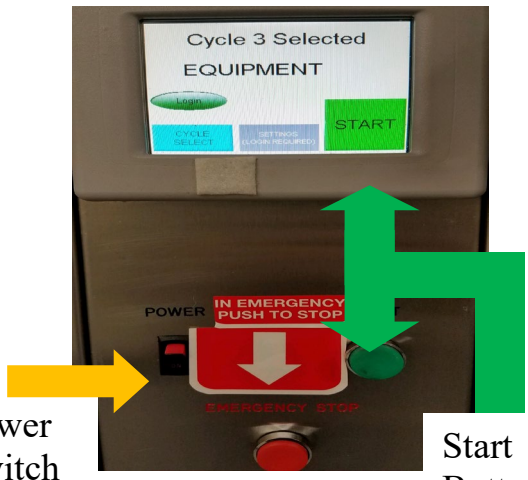
1. **How to exit the machine should you be accidently trapped inside**
2. **Use of emergency shut off safety devices for the machine. Training will be conducted and documented by the manager or supervisor.**

Starting Rack Washer

- On the washer panel turn power on.

- Panel Screen will indicate rack washer is on and ready to be loaded.
- To load the washer slide the door to open to the left.
- Place a temp tape in the washer for the first cycle of the day.
- Push/roll/place item to be washed in rack washer.
- To close the washer pull the door all the way to the right.
- Select cycle on the screen and choose from the cycle options.
  - Cycle 1 Mouse– for rodent cages, water bottles
  - Cycle 2 Rabbit –for rabbit racks, grates and pans
  - Cycle 3 Equipment for carts





Power Switch

Start Buttons

- Press green button “start” – the screen indicate cycle started.
- Once cycle is complete the screen indicate “cycle complete” and alarm sound.
- To unload washer pull the door to open to the left and remove item(s) from rack washer.
- Start procedure from top until all items are washed.

Bottle washing cart - Using Bottle washing cart

- Load bottle washing cart
- Place bottle washing cart in the center pipe of rack washer.
- Closed rack washer door and start cycle.

Rodent cage rack

- Load rodent cage rack.
- Wheel rack into rack washer.
- Close door and start cycle.

Shutting Off Rack Washer

- Rack washer automatically empties at 7:00 pm.
- Hose down inside of rack washer.
- Check the drains inside the washer, remove debris and clean the drain.

RBL Rack Washer – RBL Rack washer is Basil 4700 Cage, Rack and Utensil Washer. The rack washer is primarily used for washing rabbit racks, rabbit pans, rodent caging (shoeboxes and lids), carts and larger items. The rack washer can also be used for

washing wire bars, rodent caging shoebox tops, rabbit floors and water bottles by using a special rack made for washing those items in the rack washer. The rack washer is a contained washer that has a mechanical arm that moves over the items being washed. Each cycle washes with a pre-rinse, wash, final rinse and drying.

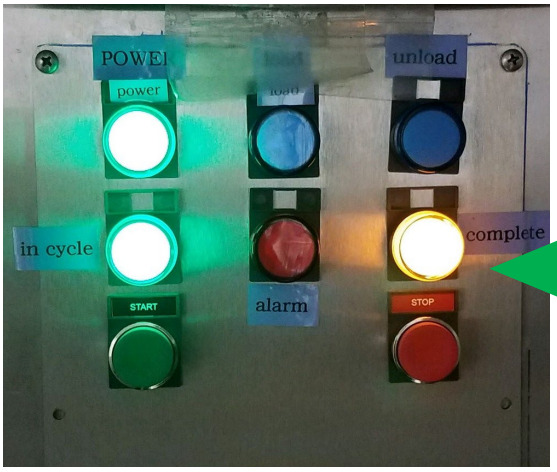
The rack washer is primarily used for washing rabbit racks, rabbit pans, carts and larger items. The rack washer can also be used for washing rodent caging shoebox bottoms, wire bars, rodent caging shoebox tops, and water bottles by using a special rack made for washing those items in the rack washer. The rack washer is a contained washer that has a mechanical arm that moves over the items being washed. Each cycle washes with a pre-rinse, wash, final rinse and drying.

<u>Do not operate</u> the rack cage washer until you have received training in the operation of the washer, and the safety features specific to the machine. Training covers:

1. **How to exit the machine should you be accidently trapped inside**
2. **Use of emergency shut off safety devices for the machine. Training will be conducted and documented by the manager or supervisor.**

<u>Starting Rack Washer</u>

- On dirty side control panel turn power on.
- Screen will indicate rack washer is on and ready to be loaded.
- Pull the door to open.
- Place a temp tape in the washer for the first cycle of the day.
- Push/roll/place item to be washed in rack washer.
- Close the door.
- Select cycle from the cycle options.
    - Cycle 1 Mouse/Rats – for shoe box cages
    - Cycle 2 Rabbits–for rabbit racks ,grates and pans
    - Cycle 3 Carts - for carts
- Press **green** button “start” –Screen indicate the cycle started.
- Once cycle is complete Screen indicate the “cycle complete “and on the dirty side. On the clean side the orange light next to “Complete” will light up.



Cycle Complete

CLEAN SIDE PANEL DIRTY SIDE DISPLAY

- On the clean side open the door and remove item(s) from rack washer.
- Start procedure from top until all items are washed.

Bottle washing cart - Using Bottle washing cart

- Load bottle washing cart
- Place bottle washing cart in the center pipe of rack washer.
- Closed rack washer door and start cycle.

Rodent cage rack

- Load rodent cage rack
- Wheel rack into rack washer
- Close door and start cycle.

Shutting Off Rack Washer

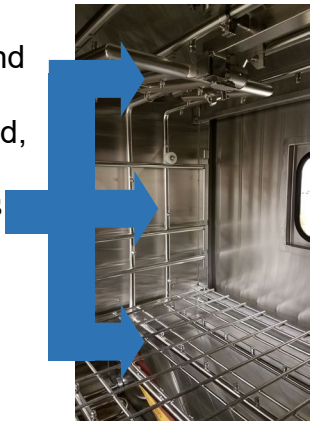
- Rack washer automatically empties at 7:00 pm.
- Hose down inside of rack washer.
- Check the drains inside the washer, remove debris and clean the drain.

Bottle Washer. RBL bottle washer is Basil 3700. The bottle washer is primarily used for washing water bottles, wire bars, feeders, and smaller items. The bottle washer can also be used for washing rodent caging (shoe box bottoms and MI tops), and some larger items that will fit in the bottle washer (one at a time). The bottle washer is a contained washer that has a mechanical arm that moves over the items being washed. Each cycle washes with a pre-rinse, wash, final rinse and drying.

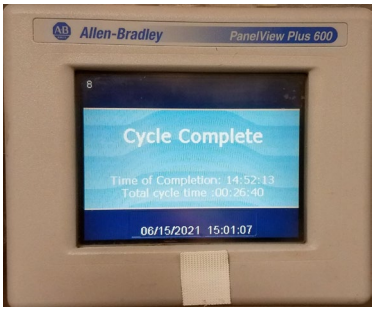
<u>Do not operate</u> the rack cage washer until you have received training in the operation of the washer, and the safety features specific to the machine. Training covers:

1. **Use of emergency shut off safety devices for the machine. Training will be conducted and documented by the manager or supervisor.**

<u>Starting Bottle Washer</u>



- The screen panel is on that indicate that the rack washer is on and ready to be loaded.
- Open the door. Check the nozzles to ensure they are not clogged, and the pulleys are on the track.
- Place a temp tape in the washer for the first cycle of the day.
- Place items to be washed in bottle washer.
- Close the door.
- Select cycle from the cycle options.
  - Cycle 1 Bottles.



- Once cycle is complete, on clean side the screen show “CYCLE COMPLETE” and the alarm sound.
- On clean side pull the door open and remove item(s) from bottle washer.
- Start procedure from top until all items are washed.

<u>Shutting Off Bottle Washer</u>

- Ensure the washer is empty, the clean side door is closed and the dirty side door is open.
- Check inside bottom of the washer for small items and remove it.

Maintenance of Rack and Bottle Washers

- Buxton performs preventative maintenance (PM) on the rack washers.
- Repairs are scheduled and coordinated with Buxton through the ICPH mechanic, RUAC supervisors, manager and the Assistant Director of Operations.

RBL Garb-el Unit – Downdraft dump station waste disposal system. This unit allows the animal bedding waste to be moved out of the vivarium via the waste water system. The Garb-el is designed to handle the elimination of soil bedding, shaving, cellulose compounds and paper board from cages.

- The Garb-el unit is a pre-wired and pre-plumbed free standing disposal unit.
- The unit consist of machine mounted controls with magnetic starter box, "Start "– "Stop" switch, solenoid valve, time delay relay control, flow interlock valve and plumbing with fittings to connect to fresh water supply, stainless steel top, water hose and hose clamps.
- A piped line connects the unit to the waste water line to handle the discharge from the garble unit.
- Fresh water is supplied at all times when the Garb-el is on.

Operation

- Don appropriate PPE (isolation gown closed at back, bonnet, N95, safety glasses, hearing protection, shoe covers, gloves)
- Check the bag in the dust control/vacuum tower and dump as necessary.
- Turn on the power to the tower using the toggle switch on the side
- Turn on the power to the Garbel by pushing the green button on the front of the machine.
- Remove any equipment (cover, feeder, water bottles stoppers, and cage card holders) or other materials (gloves, paper towels, etc.) from cages.
- Dump bedding/feed into Garbel and use plastic scraper and hose to remove bedding, food and feces from cage.
- When dumping is complete, push the small red "stop" button
- The auger will stop turning, but the blades behind the curtain will continue to run for several minutes.
- Turn the toggle switch on the dust control tower off.
- Use hose and squeegee to clean any remaining food and bedding debris from under and around the Garbel and dust control units.

Cleaning Instructions

- After each day's use, run the Garb-el for several minutes until both the hopper and grinding chamber are clear of waste material. This procedure will flush out the sewer line.

- Clean all surfaces and spray water into the Garbel to flush out all debris. Add one scoop of Virkon to kill bacteria and continue spraying water until all Virkon has been flushed out.
- Use hose and squeegee to clean any remaining food and bedding debris from under and around the Garbel and dust control units.

Special Practices, Precautions and/or Notes:

- NEVER put your hands behind the black rubber screen. Jams should only be cleared by approved personnel/technicians.
- The auger stops when the smaller red button is pushed, but the blades behind the screen continue to turn for several more minutes.
- Pushing the larger red emergency stop button shuts off power to the auger and the blades. HOWEVER, it takes about 30 seconds for the blades to stop turning!
- Only dump AUTOCLAVED/UNINFECTED bedding and food.
- Remove all foreign material from cage BEFORE dumping and place material(s) in appropriate receptacle(s).
- ONLY animal food and bedding is allowed in Garbel.
- The counter top for the Garbel is sloped toward the opening and when turned on the counter vibrates. DO NOT place small objects such as scrapers, water bottles and stoppers, cage card holders, etc. on the counter top as the vibration could cause them to move and fall into the Garb-el

Maintenance of Garb-el Unit

- Buxton performs preventative maintenance (PM) on the Garbe-el Unit.
- Repairs are scheduled and coordinated with RV Industries through the RUAC supervisors, manager and the Assistant Director of Operations.

AUTOCLAVE: Autoclave are used for sterilizing Regulated Medical Waste, Liquid, animal Carcass, Animal Racks and Rodent Cages from the RBL ABSL-3 side.

RBL has two autoclaves. One is a bulk pass through autoclave (FINN-AQUA) for autoclaving regulated medical waste, liquid, animal carcasses, animal racks and rodent cages. The second is a medium size autoclave (160S) for autoclaving regulated medical waste, liquid, animal carcasses and rodent cages.

<u>Do not operate</u> Autoclave until you have received training in the operation of the autoclaves and the safety features specific to the machine. Training covers:

1. **How to prevent to be accidently trapped inside**
2. **Use of emergency shut off safety devices for the machine. Training will be conducted and documented by the manager or supervisor.**

<u>Starting the Finn Aqua and the 160S Autoclaves</u>

- To log in: User name-tape: **buxton** and press enter.
  Password type in: **753** and press enter**.**
- There are two display panels and controllers, one in the ABSL-3 (dirty) side and one on the non-containment cage wash area (clean side) with a printer.
- The clean side display and controller will only open and close the clean side autoclave door.
- A run cannot be started unless both doors are closed and gaskets charged and the door are sealed.
- On the clean side panel turn on autoclave by turning knob on.
- Check the display panel and verify it reads “Sealed”. If it is not displayed, you must close the clean side door by pressing yellow close door button from the clean side panel until door is completely closed. The display panel will read “Door Sealed”.
- Confirm there is enough printer paper by advancing printout or opening the cover to see the paper roll. There will be a red stripe mark on the printout when is low and needs to be replaced.
- Confirm there is enough ink by reading the printout. The printout will be very faint if the ink is low. Replace the printer ribbon as needed.

Finn Aqua and 160S Controls and Touchscreen

<u>Operating the Finn Aqua Autoclave from ABSL-3 Side</u>

- From the ABSL-3 side, open the autoclave door by pushing and holding the blue **“OPEN”** door button.
- Fill out the autoclave log in the ABSL3 side and record the date, run#, cycle type, load description, SA check box, spore test check box and initials.

- All infectious waste must be placed in double autoclavable biohazard bags. In the Finn Aqua, the bags are placed in autoclavable plastic trays and on a cart a maximum of 2 carts and 8 bags (up to 38”x47” bags) of waste can be sterilized per run.
- Load your items: For waste; a maximum of up to 8 large bags (48x37”) placed individually in plastic autoclavable bins on 2 carts.
- DO NOT place the tray directly on the chamber as it will block the drain probe!
- Dirty Biozone rodent cages must be placed on carts or a bulk truck and covered with cart cover.
- A maximum of 2 carts and 56 mouse cages (28 per cart) or 48 large rodent cages (24 per cart) can be used. Alternatively, up to 60 Biozone mice cages and 48 large rodent cages can be placed on a bulk truck.
- A maximum of 6 dirty rabbit cages in an Allentown IVC or standard rack can be sterilized per run.
- Infectious waste and dirty cages must be sterilized separately as they use different autoclave cycles.
- Before closing the door check for gasket lay out, must be inside the track not sticking out if needed adjust.
- Close the autoclave door by holding down yellow “CLOSE” button until door is completely closed and “sealed”. If you accidently stop mid-way, re-press and hold down the close button for 5-7 seconds until the door begin to close again.
- Select the cycle
    - **“1”- for trash Hazardous Waste cycle**
    - **“2” – for Pass Back cycle**
    - **“3”- for Mouse cage cycle**
    - **“4” - for the Carcass cycle**.

- The waste cycle will take approximately 2.5 hours to complete.
- The cage cycle will take ~ 1 hour to complete.
- The carcass cycle will take about 4 hours to complete.
- Once the cycle is selected and autoclave door is completely closed/sealed, press the green “START “button to begin the cycle.

Operating the Finn Aqua Autoclave from Clean Side

- When the cycle is completed, the buzzer will alarm and “cycle complete” will be displayed on the clean side panel.
- Check the autoclave tape and verify a full run was completed and the correct temperature was reached.
- Record the run in the appropriate autoclave log.
- If it did not complete or failed, immediately notify the ABSL-3 supervisor, BSL-3 manager, biosafety officer or Director. Record the run in the appropriate autoclave log.

- Fill out the autoclave log book to record your waste cycle is completed (date, run#, cycle type, load description, SA check, initials, pass/fail, 2nd initials.
- Remove the cycle print, write your initials, the date and run number on the tape and place it in the autoclave binder in the sheet holder.
- To open autoclave from the clean side: press the red “STOP” button to complete the cycle and push and hold the blue “OPEN” button until the door is completely open.
- Remove Autoclaved items from autoclave.
- Waste will be placed in red bags before discarded in the large Biohazard Cardboard boxes.
- Autoclaved cages stay in RBL cage wash area for processing in the Garb-el.
- Check the drain screens and empty as necessary.
- Before closing the door check for gasket lay out, must be inside the track not sticking out if needed adjust.
- Close the autoclave door by holding down yellow “CLOSE “button until door is completely closed and “sealed”. If you accidently stop mid-way, re-press and hold down the close button for 5-7 seconds until the door begin to close again.

Operating the 160S Autoclave from ABSL-3 Side

- From the ABSL-3 side, open the autoclave door by pushing and holding the blue “OPEN “door button.
- Fill out the autoclave log in the ABSL3 side and record the date, run#, cycle type, load description, SA check box, spore test check box and initials.
- All infectious waste must be placed in double autoclavable biohazard bags.
- The bags are placed in autoclavable plastic trays.
- Attach the autoclave cart into the place and lock it onto the autoclave.
- Pull the inner shelf out of the autoclave onto the cart for loading.
- Load the shelf with plastic trays (only 3 trays per load) and push the shelf back into the autoclave.
- Disconnect the cart from the autoclave
- Before closing the door check for gasket lay out, must be inside the track not sticking out if needed adjust.
- Close the autoclave door by holding down yellow “CLOSE “button until door is completely closed and “sealed”. If you accidently stop mid-way, re-press and hold down the close button for 5-7 seconds until the door begin to close again.
- Select the cycle
    - **“1”- for trash Hazardous Waste cycle**
    - **“2” – for Pass Back cycle**
    - **“3”- for Mouse cage cycle**
    - **“4” - for the Carcass cycle**.

- The waste cycle will take approximately 2.5 hours to complete.
- The cage cycle will take ~ 1 hour to complete.
- The carcass cycle will take about 4 hours to complete.

- Once the cycle is selected and autoclave door is completely closed/sealed, press the green “START “button to begin the cycle.

Operating the 160S Autoclave from Clean Side

- When the cycle is completed, the buzzer will alarm and “cycle complete” will be displayed on the clean side panel.
- Check the autoclave tape and verify a full run was completed and the correct temperature was reached.
- If it did not complete or failed, immediately notify the ABSL-3 supervisor, BSL-3 manager, biosafety officer or Director.
- Record the run in the appropriate autoclave log.
- Fill out the autoclave log book to record your waste cycle is completed (date, run#, cycle type, load description, SA check, initials, pass/fail, 2nd initials).
- Remove the cycle print, write your initials, the date and run number on the tape and place it in the autoclave binder in the sheet holder.
- To open autoclave from the clean side: press the red “**STOP**” button to complete the cycle and push and hold the blue “**OPEN**” button until the door is completely open.
- Attach the autoclave cart into the place and lock it onto the autoclave.
- Pull the inner shelf out of the autoclave onto the cart for unloading.
- Remove Autoclaved items from autoclave.
- Unload the shelf, check trap and door channel for dirt and debris, clear if necessary.
- Push the shelf back into the autoclave.
- Disconnect the cart from the autoclave
- Waste will be placed in red bags before discarded in the large Biohazard Cardboard boxes.
- Autoclaved cages stay in RBL cage wash area for processing in the Garb-el.
- Check the drain screens and empty as necessary.
- Before closing the door check for gasket lay out, must be inside the track not sticking out if needed adjust.
- Close the autoclave door by holding down yellow “CLOSE “button until door is completely closed and “sealed”. If you accidently stop mid-way, re-press and hold down the close button for 5-7 seconds until the door begin to close again.

PHRI has three autoclaves. One is a bulk pass through autoclave (Buxton 9902) for autoclaving regulated medical waste, liquid, animal carcasses, animal racks and rodent cages from the PHRI ABSL-3 side. The second is a medium size autoclave (Small Buxton, Model 8200-35 General Purpose Steam Sterilizer) for autoclaving regulated medical waste, liquid and rodent cages for the PHRI ABSL-2 side. The third is a table top autoclave (Tuttanuer1730) in W150N inside the ABSL3. It is used for sterilizing instruments before using them for procedures.

<u>Do not operate</u> Autoclave until you have received training in the operation of the autoclaves and the safety features specific to the machine. Training covers:

1. **How to prevent to be accidently trapped inside**
2. **Use of emergency shut off safety devices for the machine. Training will be conducted and documented by the manager or supervisor.**

<u>Starting the Buxton 9902 Autoclave</u>

- There are two display panels and controllers, one in the ABSL-3 (dirty) side and one on the non-containment cage wash area (clean side) with a printer. The clean side display and controller will only open and close the clean side autoclave door. A run cannot be started unless both doors are closed and gaskets charged.
- On the clean side panel turn on autoclave by turning pushing the power switch (down).
- Check the display panel and verify it reads “Unload Door Sealed”. If it is not displayed, you must close the clean side door by holding down black close door button from the clean side panel until door is completely closed and wait 5 seconds you will hear the gasket pressurize. The display panel will read “Unload Door Sealed”.
- Confirm there is enough printer paper by advancing printout or opening the cover to see the paper roll. There will be a red stripe mark on the printout when is low and needs to be replaced.
- Confirm there is enough ink by reading the printout. The printout will be very faint if the ink is low. Replace the printer ribbon as needed.

<u>Operating the Buxton 9902 Autoclave from ABSL-3 Side</u>

- From the ABSL-3 side, open the autoclave door (push and hold the green open door button).
- Fill out the autoclave log in the ABSL3 side and record the date, run#, cycle type, load description, SA check box, spore test check box and initials.
- All infectious waste must be placed in double autoclavable biohazard bags. The bags are placed in autoclavable plastic trays and on a cart a maximum of 2 carts and 8 bags (up to 38”x47” bags) of waste can be sterilized per run.
- Load your items: For waste; a maximum of up to 8 large bags (48x37”) placed individually in plastic autoclavable bins on 2 carts.
- DO NOT place the tray directly on the chamber as it will block the drain probe!
- Dirty Biozone rodent cages must be placed on carts or a bulk truck and covered with cart cover.
- A maximum of 2 carts and 56 mouse cages (28 per cart) or 48 large rodent cages (24 per cart) can be used. Alternatively, up to 60 Biozone mice cages and 48 large rodent cages can be placed on a bulk truck.
- A maximum of 6 dirty rabbit cages in an Allentown IVC or standard rack can be sterilized per run.

- Infectious waste and dirty cages must be sterilized separately as they use different autoclave cycles.
- Before closing the door check for gasket lay out, must be inside the track not sticking out if needed adjust.
- Close the autoclave door by holding down black “close “door button until door is completely closed and wait 5 seconds you will hear the gasket pressurize.
- Press the F1 button to select the cycle.
    - **F1- for waste cycle**
    - **F2- for the cage cycle**
    - **F3 - for the carcass cycle**.
    - Only use these three cycles. You will see the cycle displayed on the screen.
    - Press the F8 button to exit the screen.
    - Press the F4 button to start the cycle then push **the Green Start button.**

Buxton 9902 Control Clean Side Panel

- The waste cycle will take approximately 2.5 hours to complete.
- The cage cycle will take ~ 1 hour to complete.
- The carcass cycle will take about 4 hours to complete.

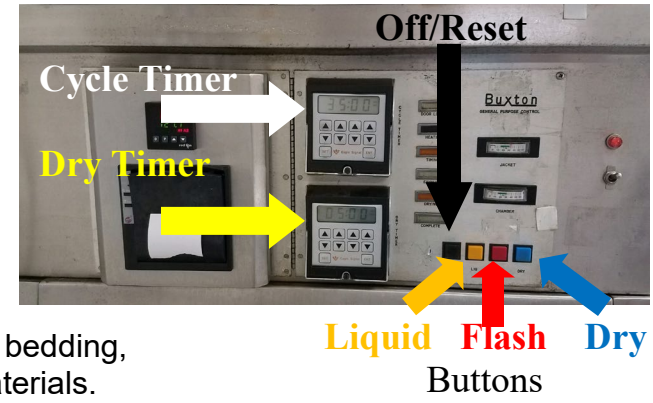
<u>Operating the Buxton 9902 Autoclave from Clean Side</u>

- When the cycle is completed, the buzzer will alarm and “cycle complete” will be displayed on the clean side panel.
- Check the autoclave tape and verify a full run was completed and the correct temperature was reached.
- If it did not complete or failed, immediately notify the ABSL-3 supervisor, BSL-3 manager, biosafety officer or Director. Record the run in the appropriate autoclave log.
- Record the run in the appropriate autoclave log.
- Remove the cycle print, write your initials, the date and run number on the tape and place it in the autoclave binder in the sheet holder.
- From the clean side: push and hold the green open door button until the door is fully retracted before removing your sterilized samples.
- Waste will be placed in red bags before discarded in the large Biohazard Cardboard boxes.
- Autoclaved cages can be covered with a cart cover and transferred to the RBL cage wash area for processing in the Garb-el.
- Check the drain screens and empty as necessary.
- Before closing the door check for gasket lay out, must be inside the track not sticking out if needed adjust.

- Close the unload side door (see step 1) if you plan to do another run otherwise keep the clean side autoclave door closed but not sealed (do not hold black button for 3 secs after closing) when the autoclave is not in use!
- Fill out the autoclave log book to record your waste cycle is completed (date, run#, cycle type, load description, SA check, initials, pass/fail, 2nd initials.
- Remove the cycle print, write your initials, the date and run number on the tape and place it in the autoclave binder in the sheet holder.
- Turn off the power switch on the clean side panel at the end of the work day.

Starting the Small Buxton Autoclave

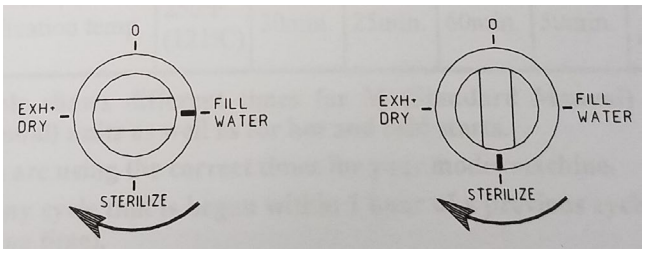
- Confirm there is enough printer paper by advancing printout or opening the cover to see the paper roll. There will be a red stripe mark on the printout when is low and needs to be replaced.
- Confirm there is enough ink by reading the printout. The printout will be very faint if the ink is low. Replace the printer ribbon as needed.
- To open the autoclave turn the handle placed on the door of the autoclave and pull the door.
- Load the autoclave. The bags are placed in autoclavable plastic trays.
- Dirty cages can be placed directly on the wired bottom.
- After loading the autoclave, close the door and turn the handle until the light indicates that door is shut.
- Set the cycle timer on the screen display:
  - Waste: 90 minutes temperature - 121.1 C
  - Cages or water bottles: 35 minutes temperature -121.1 C
  - Carcass: 180 minutes – 132 C
  - Push the bottom for the desired cycle: Dry, Flash or Liquide, depending on the load inside autoclave.
  - The liquid cycle is for water or liquid substances.
  - Dry load is used to sterilize food, bedding, contaminated cages or waste materials.
  - Flash is for sterilizing open, unwrapped material which does not require a drying time.
  - The cycle is complete when alarm sounds. (Alarm is very load so shut off as soon cycle is complete.
  - Push cancel/stop to shut off alarm.



- Check the printout to ensure the cycle is completed and correct temperature was reached.
- Turn the handle counter clockwise until the door lock light turns off and the water stops draining.
- Record the run in the appropriate autoclave log.
- Fill out the autoclave log book to record your waste cycle is completed (date, run#, cycle type, load description, initials, pass/fail)
- Remove the cycle print and fold, write your initials, the date and run number on the tape and place it in the autoclave binder in the sheet holder.
- Cleaning of autoclave should be done daily or as needed. If bedding is spilled on inside of autoclave use the shop-vac to vacuum out inside.
- At the end of day make sure autoclave is empty and the door is left slightly ajar on the cage wash side.
- Turn off autoclave at the end of the day.

<u>Starting the Tuttanuer 1730</u>

- Ensure there is distilled water in the water reservoir (10-12 oz. or 300-350 ml.). If there is not any distilled water fill the water reservoir with distilled water.
    - Ensure that the drain valve is in a CLOSED position.
    - Remove the water reservoir cover located on top of the autoclave.
    - Pour distilled water into the reservoir through the opening on top of the autoclave, until it reaches the base of the safety valve holder. **Under no circumstances fill any higher than the base of the safety valve holder.**
    - For proper operation make sure the water level is above the coils of the cooling coil.
    - USE DISTILLED WATER ONLY.
- Move the ON/OFF rocker switch, located on the front panel, to the ON position. The green power light will turn on, indicating that power is ready to be supplied to the heating elements.
- Turn the red tracking needle on the pressure gauge counterclockwise to 0 psi. The tracking needle will indicate the highest pressure reached during the cycle.
- Open the front door of the autoclave and set the Multi-purpose valve knob to the FILL WATER position.
    - The water will now flow into the chamber.
    - The water should cover the bottom of the chamber up to the groove in the front. This amount of water is 10-12 oz. (300-350 ml.).
    - When the water reaches the mark at the front of the autoclave, set the multi-purpose valve knob to the STERILIZE position.



- Load the autoclave.
    - Load items within the boundaries of the tray so that they do not touch the chamber walls, or fall off when the tray is inserted into the autoclave. The chamber walls are very hot; items that come into contact with the wall can be damaged.
    - When using a paper/plastic bag, the plastic side should always be down.
    - All instruments **must** be sterilized in an open position. Place instruments with ratchets opened and unlocked or clipped on the first ratchet position. Surfaces that are hidden because the item is in a closed position will not be exposed to the steam and will not be sterilized.
    - Do not overload the sterilizer trays. Overloading will cause inadequate sterilization and poor drying. Load trays loosely to capacity. Instruments should be loaded one level deep.
    - Empty canisters should be placed upside-down, in order to prevent accumulation of water.
    - Wrapped instruments should be packed in material which will allow steam penetration and promote drying, such as autoclave bag, autoclave paper or muslin towels.
    - **Do not stack pouches**.
- Shut the door, move the door closing devise into position and tighten, making sure the door switch is activated.
- Turn the Thermostat knob to the desired sterilization temperature.

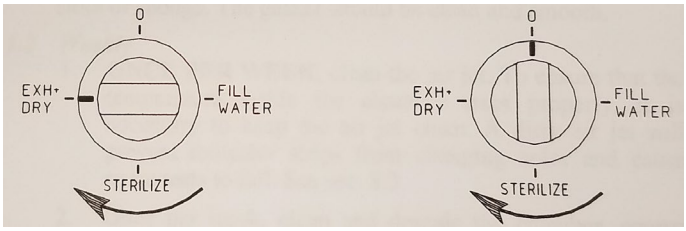
Sterilization Time Table

Material	STE. TEMP	Total Sterilization Time (does not include drying)	
		Cold Start	Hot Start
Unwrapped instruments, open glass or metal containers and any other items where such temperature is suitable.	273 degrees F (134 degrees C)	16 min	11 min
Single instruments	273 degrees F (134 degrees C)	12 min	9 min
Wrapped instruments, standard cassettes, rubber tubing and any other items where such temperature is suitable.	273 degrees F (134 degrees C)	20 min	15 min

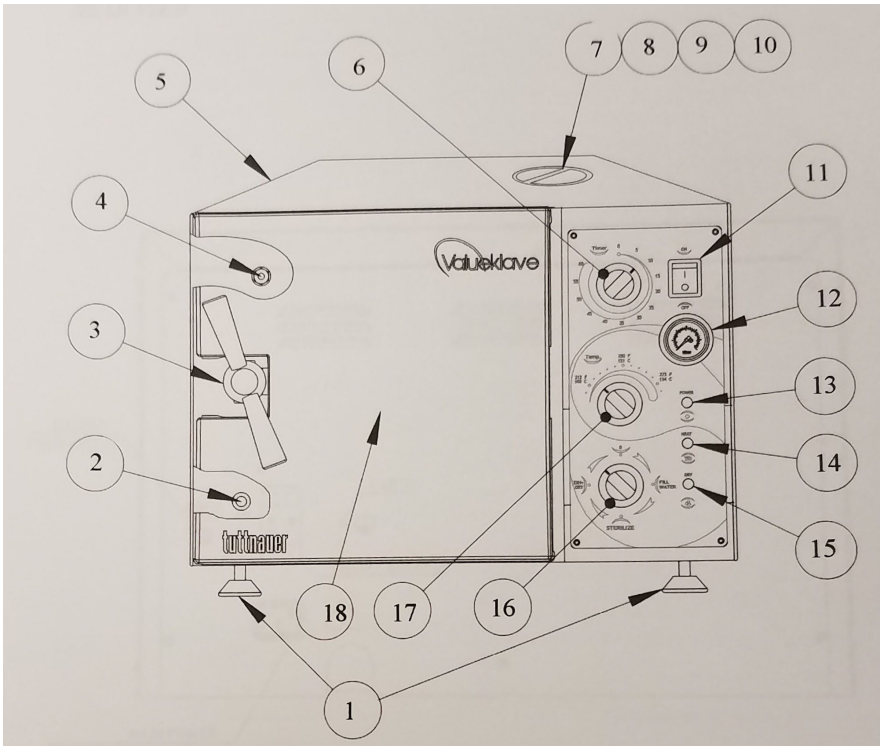
Packs and any other items where such temp is suitable.	273 degrees F (134 degrees C)	25 min	20 min
Any items where a lower sterilization temp is required	250 degrees F (121 degrees C)	30 min	25 min

- Set the Timer to the desired sterilization cycle time according to the Sterilization Time Table
    - The heat light will come on, indicating that power is being supplied to the Heating Elements and remain on until the correct sterilization pressure is achieved.
    - Once the correct pressure is reached the heat light will cycle on and off, indicating that the heating elements are turning on and off to maintain the correct sterilization pressure.
    - When the timer reaches 0 min, the heating elements are turned off and a buzzer will sound indicating that the sterilization cycle is complete.
- If unwrapped instruments were sterilized and **no drying is required**, follow these steps:
    - Once the timer has reached 0 min, turn the multi-purpose valve knob promptly to the exhaust/dry position. This will allow the steam and leftover water to return to the reservoir.
    - When the white needle on the pressure gauge has reached 0 psi the door can be opened.
    - Unscrew the door closing device, move it to the side and open the door to remove the instruments.
    - Now turn the multi-purpose valve knob to “0” or off position.
        - Note: The sterility of instruments processed in unwrapped cycles cannot be maintained if exposed to a non-sterile environment.
- If wrapped instruments were sterilized and **drying is required**, follow these steps:
    - Once the timer has reached 0 min, turn the multi-purpose valve knob promptly to the exhaust /dry position. This will allow the steam and leftover water to return to the reservoir. Do not allow the pressure to drop below 10 psi before beginning this procedure. This will cause water to remain in the valve has been turned to exhaust/dry. Resetting the timer for drying will only be heating up this water and not drying the instruments.
        - If the pressure has dropped below 10 psi, leave the unit in the STERILIZE position, leave the door closed and locked. Now reset the timer for 10 minutes.
        - When the timer reaches 0 min, the pressure should be above 10 psi (if not, add 5 more minutes to the timer). Now turn the multipurpose valve to the exhaust/dry position. This will insure that all the water has been returned to the reservoir.

        - Note: The sooner the multipurpose valve is turned to the exhaust/dry at the end of the sterilization cycle, the more effective and efficient will be the drying.
    - When the white needle on the pressure gauge has reached 0 psi the door can be opened.
    - Unscrew the door closing devise as far as it will go, but do not move it to the side, this will allow the door to open about ¾ of an inch.
    - Leave the multipurpose valve in the exhaust/dry position.
    - Reset the timer for drying, 20-30 minutes, the dry light will come on indicating that drying is active and the heating elements are back on.
    - When the timer reaches 0 minutes, the drying is complete and the dry light and heating elements will turn off.
    - Unscrew the door closing device, move it to the side and open the door to remove the instruments.
    - Now turn the multipurpose valve knob to the “0” or off position.
    - **Warning**
        - **The multipurpose valve knob should be turned in a clockwise direction only.**



- At the end of the day, turn the ON/OFF rocker switch to the OFF position



No.	Description	No.	Description
1.	Front legs	10.	Air trap jet
2.	Reservoir water drain valve	11.	Main power switch
3.	Door closing device	12.	Pressure gauge
4.	Door microswitch	13.	Power indicator light
5.	Autoclave cover	14.	Heat indicator light
6.	Timer	15.	Dry indicator light
7.	Water reservoir cover	16.	Multipurpose valve
8.	Water reservoir	17.	Thermostat (B10) knob
9.	Safety valve	18.	Door cover

BIOLOGICAL INDICATIOR (BI) SPORE TEST TO VALIDATE AUTOCLAVE

- Every Friday a BI will be placed in the autoclave by the Animal care technician users to verify the operation of the autoclave's waste and cage cycles.
- The Tuttanauer autoclave has a spore test done monthly on the first Friday of the month instead of weekly.
- Upon completion of the waste or cage cycle, the BI will be activated by labeled and placed into a 55°C incubator (Magna Amp).
- An unsterilized BI will also be labeled and incubated with the autoclaved BI as a positive control.
- The BI will be visually checked for growth (purple to yellow color change) after 48H (MagnaAmp).

- The spore test results will be documented in the autoclave logbook.
- The ABSL-3 supervisor, Manager and Biosafety Officer will be immediately notified for any failed BI spore test results.

Special Practices, Precautions and/ or Notes:

- **THIS AUTOCLAVE CAN ONLY BE OPERATED BY THE ANIMAL CARE STAFF, BSL-2/3 Lab ENGINEER or BSL-2/3 MANAGER.**
- **If cycle did not complete or failed, immediately notify the ABSL-2/3 supervisor, BSL-2/3 manager, biosafety officer or Director - do not open autoclave door on the clean side.**
- **DO NOT** open the clean side autoclave door until you have verified the waste or cage cycles has fully completed its run by checking the printout on the clean side panel (if applicable)
- Examine the cycle printout to ensure the cycle had the correct temperature for a minimum amount of time listed in the table below.

Autoclave Location	*Waste Type*	*Stericlization Temp (°C)*	*Sterilization Time (minutes)*
RBL ABSL3 Steris 160S	Waste	125	90
	Carcass	132	180
	Cages	121	30
RBL ABSL3 Finn Aqua	Waste	125	90
	Carcass	132	180
	Cages	125	35
PHRI ABSL3-Large Buxton	Waste	125	90
	Carcass	132	180
	Cages	122	35
PHRI ABSL3-Small Buxton	Waste	121.1	90
	Carcass	132	180
	Cages	121.1	35

- The Animal care taker user loading the cycle is responsible for ensuring the items are immediately removed from the autoclave once it is completed.
- The Animal care taker user loading the cycle is responsible for immediately notifying the ABSL-2/3 supervisor, BSL-2/3 Manager, Biosafety officer or Director if the autoclave breaks down during the run.
- The Animal care taker user performing the BI spore test is responsible for ensuring spore test is placed into an incubator, the results are read, documented on the autoclave log and the ABSL-2/3 supervisor or Manager is immediately notified of any failed BI test results.
- No overnight runs.

Maintenance of Autoclaves

- Buxton performs preventive maintenance (PM) on the Buxton 902, Small Buxton, Finn-Aqua and 160 S autoclaves.
- Repairs are scheduled and coordinated with Buxton through the ICPH mechanic, RUAC supervisors and or manager.

Bottle Filling Station

The RBL bottle filling station is a Basil 1000. It is used to provide drinking water to research animals that do not use the automatic watering system.

PROCEDURES:

Starting/Using Bottle filler

- Turn the bottle filler power switch to the on position.
- Check to see if the jets are clogged. If they are clogged use a paper clip to clear any debris.
- Place the rack of bottles under the jets with the bottle opening facing the jet.
- Press the **blue button** for a set amount of time for the bottles to be filled.
- Press the **green button** for the bottles to be filled for a desired amount of time. Release the button when the desired amount of water has been attained.