

Risk Assessment Form

Procedure	Use of Water Bath
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Name(s) of person performing the work	Users (Lab manager & Lab Technician & Tenants & Licensee's)		
Name & position of assessor	Khwaja Islam & Laboratory Manager	Signature	
Date of assessment	01/10/2018	RA Number	BioE 0024

Outline of procedure / activity:

There are six water baths (unstirred JBN 18) which are located in the Innovation lab 1 (696.10.14), TC lab (696.10.26), and Innovation lab 2 (696.10.22) and is used to heat samples at a constant temperature usually 37°C.

Specifications:

- Temperature range ambient +5°C to 95°C operation
- Stability: $\pm 0.5^\circ\text{C}$
- Unique Set and Forget® technology - fast heat-up, reliable temperature control
- Simple, intuitive controls - quick and easy to set temperature
- Practical front panel lock - disables front panel controls preventing unintentional changes
- Suitable for use with heat transfer beads
- Drain tap on 18L baths

Assembly of the equipment and components:

- The water bath has three main components, the bath, the lid and the base tray. The base tray fits into the bath with the feet downward so that it creates a gap between the bottom of the tank and the tray.
- The lid should only be lifted by the handle, as other parts can become hot during use. It also has a vent/thermometer hole – this hole should not be sealed as pressure could build up inside the bath.
- The bath will provide optimum performance when filled to the swage line which is typically 25mm below the top of the tank.
- Do not fill above the swage line.
- The water level used in the tank will influence the temperature accuracy and stability. Using liquid levels below the swage line needs consideration, especially when operating at higher water temperatures ($>50^\circ\text{C}$) and without a lid. We recommend the following minimum fill levels: 18 L water bath 50 mm water depth.

Operating the bath without water (dry start):

- Do not attempt to use your bath without water in the tank. The bath has an inbuilt protection mechanism known as dry start protection which will detect this condition in most circumstances and

prevent the bath from continuing to heat. In this instance the bath will display “dry” and sound an alarm.

- The tank internal surface can become very hot if an accidental dry start has occurred, even if the dry start cut out has operated. Avoid touching the tank until it has been left to cool for several minutes.
- Repeated dry starting of the bath stresses key components in the bath which can affect service life and the equipment’s warranty.
- In extreme cases a second safety cut-out in the bath can operate. If this happens, unplug the bath and have the cut-out reset by a competent person.

Operation 37°C:

- Once you have filled the bath, you will need to switch the bath off and on in order to resume operation.
- Add 18 ml of aqua-resit to prevent microorganism and algae growth. The water will turn blue.
- Always switch water bath off when not in use.

Operation above 60°C:

- The lid must be used above 60°C to maintain proper temperature control and to ensure that the water temperature reaches the set point.
- The lid will also prevent excessive evaporation that requires the bath to be filled more often and will save energy.

Flat bottomed vessels:

- Do not place flat-bottomed vessels or other objects directly on the bottom of the tank. Always use the base tray. This avoids possible damage to the heater mounted under the tank. The base tray also improves temperature control.

Allowing the bath to run dry (run dry protection):

- Always take care to avoid allowing the water to evaporate to the point that the bath runs dry. This can lead to the bath’s internal safety cut-out operating requiring a suitable qualified technician to reset it.
- The bath has a built-in advanced detection mechanism to greatly reduce the chances of the safety cut out occurring in most circumstances where the bath is left to accidentally run dry. This feature is only enabled automatically when the following criteria are met:
 - The set temperature is $>50^{\circ}\text{C}$.
 - The bath has been operating for a least one hour.
 - The water is not set to boiling point ($\geq 99^{\circ}\text{C}$).
- If the bath detects signs that the bath water level may be becoming low, it will alert the user by displaying “dry” and sounding an alarm.
- Once you have checked the water level and topped up the water level as necessary you will need to switch the bath off and on in order to resume operation.

Emptying the baths:

1. Before emptying any bath allow the water temperature to fall to a safe level and take reasonable precautions to prevent accidental spillage.
2. To empty the bath using the drain tap, push the supplied drain insert into the drain tap. Note that the water will begin to empty as soon as the drain insert is fully engaged. A length of hose can be added to the barbed end of the drain insert if required.

Setting the control temperature:

1. The water temperature of the bath can be set using the main display.

Note: that once the set point is entered the bath shows a scrolling bar display indicating the bath is heating. Once the bath is with 1°C of the set temperature this will change to displaying the actual water temperature in the bath.

Enabling the keypad lock:

1. The keypad lock is intended to help users avoid accidental changes to the set point temperature of the bath.
2. To enable and disable the lock, press and hold the lock and up or down keys for three seconds.
3. Display LOC.

Which water should you use in your bath?

1. Use tap water with care. Water with a high lime content will cause scale build up and should be avoided.
2. Distilled water and some type's de-ionised water may be used. Avoid ultra-high purity de-ionised waters.
3. Avoid using water with high levels of salts or iron. These will reduce the life of your bath.
4. Regular water changing and frequent cleaning of your bath is needed to preserve the baths corrosion resistance.

Cleaning:

1. No routine maintenance is required except for cleaning.
2. Clean the outside of the equipment with a damp cloth. Domestic detergents may be used to remove stubborn dirt. Scale on immersed parts can be removed using chemical de-scaling products designed for use on kitchen equipment that have metal parts. Descaling products may be toxic and manufacturer's instructions should always be followed.
3. Before using any other cleaning or decontamination method, check with Grant Instruments or your local representative to make sure that the proposed method will not damage the equipment.

Operator must be trained in operating water bath to guarantee safe daily use. Untrained Personnel are not be allowed to operate the tube rotator. Users should operate the water bath according to instructions in the manual. User must always ensure that power cable is in good condition, no wires exposed.

Safety precautions:

- Surfaces and water can be hot during and after use. Before emptying a bath, allow the water temperature to fall to a safe level. For 12, 18, 26, dual & 34 litre baths, empty the bath before moving it.
- This bath is only intended for use with water. Use of other fluids may invalidate warranty and present a risk of fire or explosion.
- Place on a stable flat surface to reduce the risk of accidental spillage.
- No user serviceable parts. Risk of electric shock after disassembly or operation with covers removed.
- Not for use in environments with a risk of flammable or explosive gases. To be operated within the limits listed in manual guide.
- Only use the mains cord provided or one with an identical rating. Ensure that the mains plug and the switch are easily accessible.
- A clearance of >10cm around the bath is required to ensure adequate air flow.
- If a potentially hazardous liquid is spilt onto the equipment, disconnect it from the power supply and

have it checked by a competent person. It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on the equipment.

- Clean the outside of the equipment with a damp cloth, using water and domestic cleaning products only. The use of other chemical cleaning agents may damage the equipment. Always follow the manufacturer's instructions and any applicable legislation about the use of potentially hazardous substances.
- For optimum performance prevent tray from touching bath sides.
- Before first switching on the bath please remember to fill the bath with water. Switching the bath on dry can damage the heater and could invalidate the product warranty.

Potential hazards

Substance or item handled	Associated Hazard (s)	Existing Control Measures	Risk (L/M/H)	Further Action required	Risk (L/M/H)
Use of water bath	Electrical hazard - Electrical shock – danger of death.	Only switch on the device if the device and power cable are undamaged. Only trained personal are allowed to use the water bath. Water bath system are earthed, protective earth connection for the machine is provided using 13A plug fitted to the machine (RCD protected). Make sure it has been PAT tested. Regular visual checks of power cords for fault, fraying or wear and regular electrical safety check. Any faults reported and repaired before use.	L	No further action required if the existing control measures are adhere to.	L
Use of Aqua-resist	Highly flammable	Use 1ml per 1 litre of water. Refer to BioE COSHH 0008.	L	No further action required if the existing control measures are adhere to.	L

Persons potentially at risk:

Only the user or others near by

Action in event of an accident or emergency:

1. **Fire:** raise the fire alarm and evacuate the area.

Arrangements for monitoring effectiveness of control:

Daily inspection of equipment by lab technician.

Instruction and training given to all operators which is reviewed annually.

Existing operators receive annual refresher training.

Annual pat testing by external contractor.

Arrangements for monitoring effectiveness of control:**Review of the Risk Assessment:**

Date of review		Name of reviewer	
Date of next review		Signature	

Have the control measures been effective in controlling the risk?

Yes	No
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Have there been any changes in the procedure or in the information available which affect the estimated level of risk from the listed substances

Yes	No
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What changes to the control measures are required?

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