

## Risk Assessment

<b>Procedure</b>	Use of Thermo Scientific Incubator Shaker MaxQ Mini 4450
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<b>Name(s) of person performing the work</b>	Users (Lab manager & Lab Technician & Tenants & Licensee's)		
<b>Name &amp; position of assessor</b>	Khwaja Islam & Laboratory Manager	<b>Signature</b>	
<b>Date of assessment</b>	01/10/2018	<b>RA Number</b>	BioE 0035

### Outline of procedure / activity:

The Thermo Scientific Shaker MaxQ Mini 4450 benchtop incubator shaker is small capacity orbital shaker and is ideal for cell culture, protein expression, extraction process and much more. The inner chamber of this incubator shaker can handle four 1L flasks at the same time, while being small enough to fit on a standard lab bench.

Digital units feature variable speed control from 15–500rpm with a maximum capacity load of 15.9kg, maximum height of a bottle on platform is about 8.5 inches, adjustable with push-button controls on membrane keypad, and a solid-state brushless DC motor. Three separate LED displays indicate temperature, speed, and operating time. Platform rotation stops and audible and visual signals indicate deviations of  $\pm 10\%$  of set speed. Visual/audible signals also indicate temperature deviations and heat turns off if temperature deviates  $\pm 1^\circ\text{C}$  from set point. Timer allows for continuous operation or timed shaking from 0.1–999 minutes, or from 0.1–999 hours. Soft-start feature helps prevent sudden starts and stops to eliminate splashing of vessel contents and wetting of flask closure.

The upright chiller is required when temperatures from 20 to 30°C (60 to 86°F) in the shaker chamber are required. The chiller pumps a mixture of ethylene glycol and water through a cooling coil in the shaker. A fan blows air over the cooling coil to obtain a refrigerated atmosphere. The upright chiller can only be used with shakers that contain a cooling coil.

Units incubate a small number of vessels such as Erlenmeyer flasks, microwell plates, or test tubes. Monitor and control chamber temperature with PID temperature controller. Visual, user-adjustable over temperature safety signal with independent thermostat provides additional backup by controlling the heat if the main controller fails. Triple eccentric drive enables continuous 24-hour operation, handles heavier loads, and provides smooth uniform agitation of full or unbalanced loads even at high speeds. A safety interlock stops the platform motion when the clear polycarbonate lid is open. Shakers accept 33x28cm (13x11") platforms that accommodate four 1L flasks.

#### Specifications:

- Shaking motion: Orbital
- Orbit (mm): 190
- Speed range (min-1): 15 – 500
- Temperature accuracy at 37 (°C):  $\pm 0,1$
- Platform W×D (mm): 280×330
- W×D×H (mm): 691×358×401
- Max. load (kg): 15,9
- Shipping weight: 35 kg

#### Clamps for Universal Platform provided:

1 x 125ml flask  
1 x 250ml flask  
1 x 500 ml flask  
1 x microplate/deep well plate  
ADJ ANGLE TUBE RACK 72-13MM

#### User Profile:

The Thermo Scientific Shaker MaxQ Mini 4450 benchtop incubator shaker only operated by trained lab personal who have carefully read the operating manual and are familiar with the device functions.

#### Operations:

##### Turning shaker on:

1. Press POWER switch once (I) to turn ON shaker.
2. POWER switch a second time (O) to turn OFF shaker.

**Note: There** will be a 3 second delay from the time power is turned on to the time the shaker is activated - control panel will illuminate when shaker power is activated.

##### Setting shaker speed:

1. Hold down appropriate arrow membrane switch in the speed module of the control panel, up or down, until desired speed is set up to 500 rpm. SET RPM light will illuminate.
2. Press START membrane switch to begin shaking. RPM light will illuminate.
3. Press STOP membrane switch to end shaking. SET RPM light will illuminate.

**Note:** Speed can be changed without pressing the START or STOP switches. Simply press the appropriate UP or DOWN switch until desired RPM is reached.

##### Safety precautions:

- Do not modify construction and/or assembly of equipment.
- Do not remove tags, labels, decals or other information from the unit.
- Stand clear of equipment when it is operating.
- If shaking action will result in the evolution of gases or fumes, carry out the operation in a well-ventilated laboratory hood.
- Do not use equipment for other than its intended purpose use only the accessories and attachments that are shipped with the equipment or are specified for it? Substituting other attachments or accessories can produce hazards or make the unit inoperative.
- Perform regular maintenance service as specified in this manual and keep unit in good repair. Do not

operate with known defects.

- Do not use the shaker to mix flammable materials or where the transfer of mechanical energy to glass could cause glass breakage.
- Drive interrupt halts shaking action when lid is opened.
- 35 lb (15.9 kg) platform load capacity at safe speeds and less than 500 rpm for digital shakers.
- Leave shaker disconnected when not in use.
- Make sure all vessels are securely clamped before turning on unit.
- Wherever possible, vessels should contain a stopper to prevent hazardous substances being thrown out during the mixing action.
- Do not operate the shaker at speeds that will cause the contents of vessels to be thrown out.
- It is recommended that shaking action be started at a low speed in order to check that all vessels are secure and that no spilling of contents will occur.

### Potential hazards

Substance or item handled	Associated Hazard (s)	Existing Control Measures	Risk (L/M/H)	Further Action required	Risk (L/M/H)
Handling of incubator Shaker	Electrical hazard - Electrical shock – danger of death.	Only switch on the device if the device and power cable are undamaged. The lethal voltages inside of the device is not accessible which is contained in housing that is closed and undamaged. Do not remove the housing of the device. Only trained personal are allowed to use the incubator refrigerated shaker. Annual pat testing. Regular visual checks of power cords for fault, fraying or wear and regular electrical safety check. Make sure floor around shaker is dry. In the event of accidental spilling or splashing of liquids, clean up and/or neutralize the spilled liquids before continuing. Any faults reported and repaired before use.	L	No further action required if the existing control measures are adhered to.	L

Biological samples	Health risk due to contact with biological samples	Must wear PPE (lab coat, safety glasses and gloves). Must have a risk assessment for their work to be carried out using the device including disinfection procedure if there is a spillage inside the device (i.e. Decontamination).	M	No further action required if the existing control measures are adhered to.	M
Substances	Explosion hazard	The device is used in a safe environment, e.g., the open atmosphere of a ventilated lab. Do not use this device to process any explosive or highly reactive substances. Do not use this device to process any substances which can create an explosive atmosphere. The device is not explosion-proof and should never be used with flammable substances or used to grow organisms that produce flammable by-products.	M	No further action required if the existing control measures are adhered to.	M
Burns due to hot metal on the device and hot flasks	Burns	Must wear PPE, use heat resistance gloves when handling flasks and platform.	M	No further action required if the existing control measures are adhered to.	M

<p>Heavy load (35kg)</p>	<p>Health risk due to lifting heavy loads i.e. crushing.</p>	<p>Only lift the device with another person or using a suitable aid. Make sure to use a transport aid for transportation over long distances. Manual handling training received before attempting to move the device. Lifting and transporting the shaker without suitable technical aids can result in crushing and other injuries.</p>	<p>M</p>	<p>No further action required if the existing control measures are adhered to.</p>	<p>M</p>
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**Persons potentially at risk:**

Only the user or others near by

**Action in event of an accident or emergency:**

1. **First Aid Measure:**  
**Burns** – immersing the burn in cool water immediately, removing clothing from the burn area, and keeping the injured area cool for at least five minutes (preferably longer). Any burns to the face or eye or any burns that blister should be seen by a physician.
2. **Fire:** raise the fire alarm and evacuate the area. Use correct fire extinguisher if you have been trained and it is safe to do so.

**Arrangements for monitoring effectiveness of control:**

Daily inspection of equipment by lab technician.

Annual preventative maintenance by external contractor (Thermo Fisher).

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

Existing operators receive annual refresher training.

Annual pat testing by external contractor.

**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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**Declaration by Tenant/Licensee/Technician:**

I confirm that I have read this Risk Assessment and that I understand the hazards and risks involved and will follow all of the safety procedures stated. Where PPE has been identified as a control measure, I will ensure that it is worn.

**Declaration by Laboratory Manager (LM):**

I confirm that the tenant/licensee/technician who has signed below is competent to undertake the work. My counter-signature indicates that I am happy for the work to proceed.

Name (Please print)	Signature	LM Countersignature	Date