

# MerMade safety supplement

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For Research Use Only. Not for use in diagnostic procedures.



# MerMade safety

## **WARNING**

Read and understand equipment operator's manual before operating or performing maintenance. Failure to do so could result in serious injury or death.

Always follow your facility's PPE program when operating or performing maintenance on this instrument.

### Safety

All operators should be well versed in good laboratory practices, be trained in safe operation and use of instrument and be familiar with all SDS's for chemicals involved in oligonucleotide synthesis. The information and instructions contained in this user manual are accurate and reliable to the best of our knowledge.

Standard ANSI Z35.4 convention is used throughout manual.

Instrument must be operated in manner specified by Biosearch Technologies.

It is important that instrument is installed and operated in compliance with health and safety requirements. User is responsible to ensure all requirements are identified and followed. Failure to do so may result in injury or damage to instrument. Read and understand user guide before operating instrument.

Instrument incorporates a motion system and stores and delivers hazardous chemicals. Possible injury may result from motion system, electrical shock, and from inappropriate handling of chemicals.

### Reagent Delivery System

Instrument uses solenoid valves to deliver reagents, under argon pressure, to each of columns on machine in a specific order for synthesis to occur. Once delivered, reagents are removed from columns through a vacuum system.

### Motion system

## **WARNING**

Do not attempt to disable slide door sensor. Do not use Injection Head door or Reaction Chamber window to access reaction chamber while XY table is in motion. This could result in serious injury.

Reaction chamber access door is fitted with a sensor to disable slide movement if door is opened while slide is in motion.

Do not attempt to disable this sensor and never use Injection Head door or Reaction Chamber window to access Reaction Chamber while table is in motion.

Should an accident or collision occur, operator can disable slide by turning off power switch on back of instrument. This will close all valves, stop all motion and release motor so that slide may be moved by hand. User should familiarise themselves with power switch location in case of emergency.

Under no circumstances will equipment supplier be liable for any incidental, consequential or any special damages of any kind whatsoever, including but not limited to lost profits arising from or in any way connected with use of equipment or this user manual.

Communication between motion system and computer is over a serial cable connected between computer and instrument. COM port used by software is set in configuration files for instrument.

On most instruments software is set to use COM1. If communication cannot be established please contact Biosearch Technologies Field Service for assistance.

### Electrical system

#### **WARNING**

Remove power supply from instrument before opening back cabinet. Failure to do so may result death or serious injury.

Power supply and electronics are in a control box which can be accessed from back of instrument. Unplug instrument from main power supply before opening control cabinet unless instructed to do so by Biosearch Technologies Field Service. If opening cabinet with power on, ensure proper grounding and pay careful attention to warning labels inside cabinet. See component identification section for more information

### Chemical safety

All of chemicals used by MerMade are hazardous. Each reagent is accompanied by a warning on bottle or canister label. Read these warnings carefully and follow instructions for handling and storage. Refer to SDS from manufacturer and follow any instructions regarding preparation, storage, handling and disposal of chemicals. It is user's responsibility to determine suitability of any chemicals used on MerMade and to develop a safe procedure for use.

#### **WARNING**

Chemicals are stored under pressure in bottles when in use on MerMade. Bottles are not designed for use at high pressure.

### Pressurised solvent bottles

#### **WARNING**

Use minimum level A3 cut resistant gloves underneath appropriate PPE gloves when installing and removing bottles unless additional grip is needed.

#### **WARNING**

LGC Biosearch Technologies is aware of the increased inherent risk of bottle breaking from repeated heating and cooling associated with cleaning process. Biosearch Technologies recommends that bottles are not reused or cleaned via a heating/cooling process.

Bottles are not designed for use at higher pressures and may explode if argon bottle pressure exceeds 30psi (2bar). There is a safety relief valve on instrument that is set to automatically relieve pressure in excess of 25psi (1.7bar). If pressure rises beyond recommended safety limit and relief valve does not engage immediately turn off gas flow at regulator on gas cylinder and loosen a reagent bottle cap to vent pressure on bottles.

### Cleaning and decontaminating chemical spills

#### **Notice**

Biosearch Technologies recommends users to follow their company's safety procedures on cleaning, decontaminating and disposal of hazardous chemicals. If needed, consult Biosearch Technologies for assistance in creating safety procedures.

In event of a chemical spill either on, inside, or on outside of instrument, Biosearch Technologies requires that if such an event occurs, user must immediately discontinue use of instrument and address chemical spill.

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**Risk reduction: Solvent flammability**

All solvents used on instrument are extremely flammable. Biosearch Technologies recommends that all users follow safe laboratory practice procedures when handling solvents on instrument. This includes keeping bottles tightly closed, stored in an appropriate flammable cabinet when not in use, and that all spills are immediately addressed according to facility policy. Any and all possible sources of static electricity or ignition should be avoided when instrument is in use.

## Additional safety notes:

- Do not operate instrument unless you have been trained to do so.
- Do not operate instrument until you read and understand operating instructions. Thoroughly familiarise yourself with instrument and its controls.
- Always wear safety goggles and any other required safety equipment as required by your company's Personal Protective Equipment (PPE) policy.
- Never remove warnings displayed on instrument. Replace any worn or damaged labels. Contact Biosearch Technologies for replacement labels.
- Do not operate this instrument in an atmosphere containing explosive gases.
- Only electrical cords supplied by Biosearch Technologies are approved for use with this instrument.
- Instrument doors must be securely closed while instrument is in operation.
- If it is necessary to utilise an electrical extension cord to support this instrument, it is required that cord be grounded and rated to correct amperage.
- Never operate an instrument with safety guards removed.
- Electrical covers on instrument should only be removed by trained personnel.
- Disconnect main power supply before removing any covers.
- Do not substitute fuse or circuit breaker ratings.
- Connect instrument to suitable power supply in accordance with local electrical safety regulations.
- Instrument must be grounded during operation.
- Connect instrument to a suitable electrical supply according to local regulations.
- Do not break external connectors or connections while system is on.

- Do not bypass safety switches on instrument.
- Lock out-tag out all energy sources before servicing instrument.
- Check that all weights are supported before dismantling or adjusting any part of instrument.
- After performing adjustments or part replacement ensure that all parts are moving freely and will not cause damage to instrument.
- Do not modify instrument in any way. Unauthorised modifications can cause serious damage and void warranty.
- Disconnect air supply and electrical supply prior to removing safety guards.
- Certain components become hot during correct operation of instrument. Components are marked and care should be taken to avoid personal injury.
- Instrument should only be used in a ventilated area.
- Instrument should not be immersed in solvents.
- Do not use Acetone or abrasive cleaners.
- Biosearch Technologies accepts no responsibility for misuse of instrument.

### General maintenance safety

- Biosearch Technologies is responsible for instrument repairs. Always contact Biosearch Technologies before performing any repairs or maintenance on instrument.
- Do not operate faulty or damaged equipment. Always perform proper service and maintenance procedures.
- Do not service an instrument without thorough qualifications. Ensure familiarity with necessary service tasks.

### Cleaning safety

- Always wear safety goggles and any other required safety equipment as required by your company's Personal Protective Equipment (PPE) policy.

- Clean bottle threading and bottle caps before attaching new bottle.

### Heat safety

- Do not touch heated surfaces.

### Chemical safety

- Follow all Safety Data Sheet (SDS) recommendations.
- Do not touch, ingest, or inhale samples.

### Electrical safety

- Instrument operates on a ~110V/250VAC single phase supply. Electronics are located in upper back cabinets. Unless specifically instructed by a Biosearch Technologies representative you should unplug instrument from wall supply before opening control cabinet. Failure to do so exposes a possibility of an electrical shock. If it is necessary to open box with power ensure you are properly grounded and pay careful attention to warning labels inside box.

## Recognising safety precautions

### Notice

If any safety stickers are damaged or missing, contact Biosearch Technologies for replacements. All warning symbols must be in accordance with IEC 417.

### Warning safety precautions

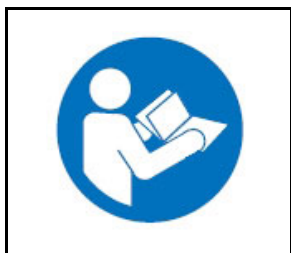


Figure 1

Warning - Read Owners Manual Before Operation (Figure 1).

### Caution safety precautions



Figure 2

Warning - Exclamation Point (Figure 2).

Alerts user to presence of important operating and servicing instructions.



Figure 3

Warning - Pinch Point (Figure 3).

Found on movable components where there is a chance of a body part getting caught in instrument.

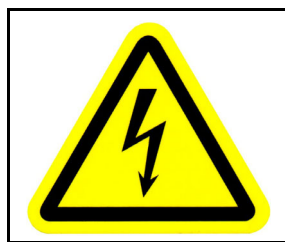


Figure 4

Warning - Electrical Shock Risk (Figure 4).

Alerts user to presence of dangerous voltage and risk of electric shock.



Figure 5

Warning - Poison/Toxic Material (Figure 5).

Indicates presence of substances that may cause harm if they enter body. Possible routes of exposure are through inhalation, skin contact, and ingestion. Hazards depend on toxic material, route of exposure, and concentration of material. Please refer to SDS for hazards associated with each chemical used on synthesizer.



Figure 6

Warning - Corrosive Material (Figure 6).

Indicates corrosive substances that can eat away skin if there is direct contact. Such materials should always be stored at proper humidity and temperature conditions in proper cabinets. All employees who handle corrosive substances should be properly trained and wear gloves, protective clothing, and face protection.

## Stopping instrument

**CAUTION**

Push Power Button (1) (*Figure 7*) to stop instrument in an emergency.

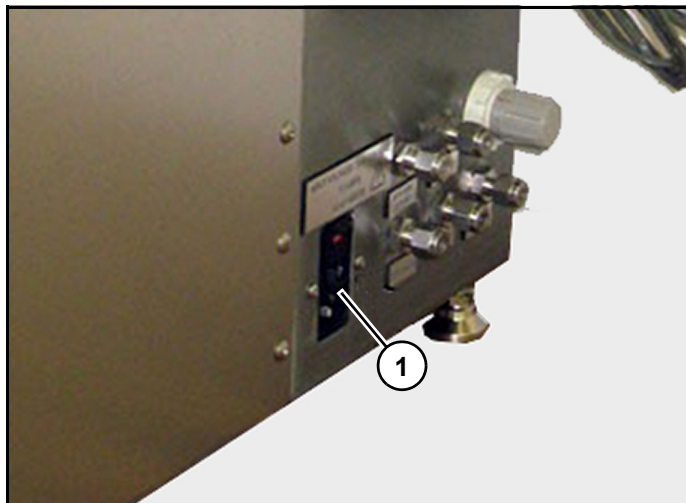





Figure 7

In case of emergency, operator can disable instrument by turning off power button (1) (*Figure 7*) to cut power to synthesizer. This will close all valves, stop all motion and release motor so that slide may be moved by hand.



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