##

**MIG WELDER**

## Scope

This document is intended to estimate potential human health and environmental risks posed by current and potential future conditions at **State Library of Queensland (State Library) Fabrication Lab** Facility. The risk assessment describes the approach to the risk assessment and facilitates appropriate ways to evaluate current and future risks.

Refer to the **Safe Operating Procedures** (**SOP**) for information regarding the safe usage and check list for this equipment.

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| Plant/Equipment Description: **BOC MiG Welder** |
| Leaders:  **Daniel Flood** |
| Locations:  **Fabrication Lab** |
| Assessment Date:  **02/03/2020** | Review Date:  **02/03/2021** |

*N.B. This assessment can remain active for up to 5 years. However, an annual monitoring and review process should be undertaken and recorded – refer to the last page of this document.*

*Below are the details of the manufacturing or production processes attributed to this item of equipment categorised by their assessed inherent risk levels (refer to the Equipment/Process Risk Matrix). The actions required for approval for each level of inherent risk are mandatory.*

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| **Inherent Risk Level** | **Details of Processes** |  **Action Required/Approval** |
| **CAUTION –** Intense electromagnetic interference generated from high voltage arc welding equipment has the potential to cause cardiac pacemakers to operate incorrectly. If concerned seek medical advice before operating – remain at least 2 metres from the power unit and 1 meter from the welding arc. |
| 🗹 | **High** | * When welding (fusing) various materials together. Different shield gasses are used depending on the materials to be welded.
* When the MIG welder is used correctly and carefully for the purposes for which it was designed.
* Metals that can commonly be welded using this process include: Mild steel, aluminium, titanium, copper, stainless steel, carbon and low alloy steels, and cast iron.
* When all appropriate welding PPE is available and are worn by all participants.
* When all resulting UV radiation is shielded.
* **NB: It is recommended that members DO NOT have access to this welding equipment. Only suitably experienced staff, volunteers and contractors.**
 | * A *Plant Risk Assessment* is required to be completed.
* Supervisor approval prior to conducting this activity is required.
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Minimum standards

| Minimum qualifications and experience *Listed below are the general “minimum” recommendations for the management of this Plant/Equipment.*🗹 *Indicate the minimum management controls.*  |
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|  X State Library staff with experience, ability and competency in the safe use of this plant/equipment  *(indicate one or more of the following):*X Specific knowledge of the safe and correct use of this plant/equipmentX Experience (i.e. previous involvement and familiarity) in the safe use of this plant/equipmentX Demonstrated expertise, ability and competency with this plant/equipmentx Documented qualifications relating to the use of this plant/equipment (e.g. in a staff profile) **OR** X A Contractor, other than a State Library staff member, with:X Expertise in the safe and correct use of this plant/equipmentX Documented qualifications that demonstrate experience, ability and competency in the safe use of this plant/equipment. |
|  X Will any staff require initial and/or ongoing training for the safe use of this plant/equipment?If yes, give details:  **Welding training and safety induction** |
|  [ ]  Will students be operating this plant/equipment?If yes, state how members use of this plant/equipment will be managed (e.g. Workshop Safety Induction)Give details:  |
|  Further information if required: **It is recommended that members DO NOT have access to this welding equipment. Only suitably experienced staff, volunteers and contractors.**  |
|  |
|  Minimum control requirements  |
|  Supporting documentation available in the school on this plant/equipment includes: X Operators ManualX Safe Operating Procedures (SOP)X Equipment Maintenance Records (EMR)[ ]  A process for recording member safety induction e.g. member induction register X A process for recording staff training and experience, e.g. Staff induction register |
|  X All guards are in place and in good working order for this plant/equipment  |
|  X Safe Working Zones are defined for this plant/equipment (e.g. yellow lines and/or appropriate signage)  |
|  X Suitable personal protective equipment (PPE) is available to be used by all operators |
|  X This plant/equipment complies with relevant safety standards |
|  Further information if required:  |

Hazards and control measures

*Listed below are indicative hazards/risks and suggested control measures. These are by no means exhaustive lists. Add details of any other hazards/risks or additional controls you intend to implement.*

🗹 *Indicate the control measures adopted. Detail their implementation and any additional controls required.*

| **Hazards/Risks** | **Hierarchy of Recommended** **Control Measures** | **Yes** | **No** | **Details of how this will be implemented***(and any additional controls)* |
| --- | --- | --- | --- | --- |
| **Exposure to Rotating****or Moving Parts:*** **Entanglement and**

**Entrapment**Could hair, clothing, ties, jewellery or other materials become entangled with moving parts of plant or materials in motion?* **Striking**

Could anyone be struck by moving objects such as the work piece being ejected, or by the unexpected or uncontrolled movement of the plant or work piece? * **Crushing and**

 **Pinching**Could anyone be crushed or pinched due to falling, uncontrolled or unexpected movement of plant or its load tipping or rolling over, or contact with moving parts during testing, inspection or maintenance?* **Cutting, Stabbing**

 **and Puncturing**Can anyone be cut, stabbed or punctured by coming into contact with moving plant or parts, or objects such as a protruding welding work piece or waste materials? | 1. Where possible, potentially hazardous portable welding equipment, including all MIG welders, are substituted or replaced with less hazardous alternatives.
 | X | [ ]  | **Standard LOTO Procedures** |
| 1. All necessary guards and safety devices are in place protecting workers from hazards including IR and UV radiation, electrical components or cabling and dangerously hot molten metal.
 | X | [ ]  | **Standard LOTO Procedures** |
| 1. Staff training is provided to minimise exposure to these hazards and risks.
 | X | [ ]  | **Safety induction** |
| 1. Safe operating procedures (SOPs) are available and clearly displayed.
 | X | [ ]  | **Located with equipment and in SOP folder** |
| 1. Warning “Danger” tags (or similar) are affixed to all welding equipment under repair or maintenance preventing workers from using the equipment.
 | X | [ ]  | **Standard LOTO Procedures** |
| 1. “Safe Working Zones” are clearly defined. Where practical, all MIG welding activities are isolated away from others.
 | x | [ ]  | **Supervisor or JSA to address requirements** |
| 1. Operators are required to remove all jewellery, tuck in loose clothing and tie back long hair.
 | X | [ ]  | **As per SOP requirements** |
| 1. All approved personal protective equipment (PPE) is used where required.
 | X | [ ]  | **All PPE is provided as per SOP requirements**  |
| 1. Specifically, approved protective welding helmets and goggles, leather aprons, jackets and work boots are worn by all workers when operating any welding plant and equipment.
 | X | [ ]  | **Specific PPE is provided as per SOP requirements**  |
| **Slips, Trips, Falls** **and Abrasions:**Can anyone using the plant or in the vicinity of the plant, slip, trip or fall due to the working environment or other factors?e.g. Poor housekeeping, dust on floors, slippery or uneven work surfaces, power cables across work areas causing injuries and abrasions? | 1. Slip resistant flooring is encouraged. Regular checks are made for unsafe wear and damage. Inspections are made for any power leads and gas lines, etc.
 | X | [ ]  | **Anti-slip mats available if required** |
| 1. Procedures are in place for the disposal of all waste materials around all MIG welding activities.
 | X | [ ]  | **Storage & waste disposal procedures** |
| 1. Staff training is provided to minimise exposure to these hazards.
 | X | [ ]  | **Safety induction** |
| **Environmental:*** **Noise**

Is it likely that the normal operation of this plant will produce excessive noise levels?* **Dust, Fumes and**

**Vapours**Is it likely there will be airborne dust particles, toxic fumes or volatile vapours produced and therefore be present in the workspace?* **Vibration**

Is the normal operation of this plant likely to create severe or excess vibration that could be transferable to the operator?* **Lighting**

Is there insufficient lighting to operate this plant in a safe manner? Is there a possible strobe lighting effect caused by faulty fluorescent tubes in the workspace?* **Water and Moisture**

Is there a danger of surface water on the floor in the workspace? | 1. All portable welding equipment is regularly maintained to help minimise the risk of exposures to these hazards.
 | X | [ ]  | **Routine checks and maintenance**  |
| 1. All portable welding equipment maintenance is documented.
 | X | [ ]  | **Service records** |
| 1. Exposure to noisy workshop environments is monitored and evaluated regularly for all workers.
 | X | [ ]  | **Monitoring of excess noise during operations by supervisor** |
| 1. Engineering controls (or physical changes) such as mandatory machinery guarding or any protective safety screens and enclosures are in place in all workspaces and all in good working condition.
 | X | [ ]  | **As per manufacturers standards** |
| 1. Staff training is provided to minimise exposure to these hazards.
 | X | [ ]  | **Safety induction** |
| 1. All ducted welding fume and dust extraction systems are fully maintained, cleaned and emptied, connected and operational.
 | [ ]  | X | **Outdoor well ventilated work areas only.**  |
| 1. Good lighting is provided to all workspaces and this is maintained on a regular basis. Fluorescent tubes are checked and replaced as required.
 | X | [ ]  | **As per workspace risk assessment and housekeeping procedures**  |
| 1. All approved personal protective equipment (PPE) is used where required.
 | X | [ ]  | **All PPE is provided. As per SOP requirements** |
| **Electrical:**Can the operator be injured by electrical shock due to working near or contacting with damaged or poorly maintained live electrical conductors such as power outlets, extension leads, safety switches, starters and isolators or casual water on the floor near plant and machinery?  | 1. All portable electric welders have a wall mounted isolation switch that disconnects all electrical power.
 | X | [ ]  | **15-amp portable RCD**  |
| 1. “Lock Out” or warning “Danger” tags are affixed to all electrical welding equipment under repair or maintenance preventing workers from using the equipment.
 | X | [ ]  | **LOTO procedures**  |
| 1. Visually checks are made of all portable electrical welding equipment, their electrical switches, plugs and power leads, etc.
 | X | [ ]  | **Routine checks and maintenance**  |
| 1. Electrical safety inspections are completed regularly as per guidelines for all portable electrical welding equipment.
 | X | [ ]  | **Annually. As per QLD WHS requirements** |
| 1. Electrical maintenance on all portable power tools is documented.
 | X | [ ]  | **Electrical register**  |
| **Exposure:*** **Heat, Burns and Scalds**

Could the plant operator be exposed to heating elements, exposed flame, flashback, molten metals or hot fluids likely to cause scalding or burning? Humid and hot work environments are often uncomfortable resulting in stress and low productivity.* **Friction**

Is the plant likely to generate heat by friction? Could the plant operator accidentally come into contact with moving materials or machinery components resulting in friction burns to the skin, particularly hands?* **Radiation**

Could workers be exposed to UV and IR radiation? Working with an electric arc welder exposes workers to many dangers, including burns. An electric arc will generate UV and IR radiation causing severe burning and discomfort to unprotected skin. Overexposure to UV radiation can also cause skin cancer.* **Hazardous**

**Substances**Is it likely that the plant operator or others nearby in the workspace could be exposed to hazardous or toxic chemicals such as oils, hydraulic fluids, greases, coolants, volatile vapours or toxic fumes? | 1. Portable welding equipment is regularly maintained to help minimise the risk of exposures to these hazards.
 | X | [ ]  | **Routine maintenance and servicing** |
| 1. Plant and machines likely to generate excessive heat or sparks are isolated, ventilated and monitored closely.
 | X | [ ]  | **Outdoor use in well ventilated areas**  |
| 1. All portable welding equipment maintenance is documented.
 | X | [ ]  | **Service records** |
| 1. Spectra® PVC welding curtains (or similar) are provided around all electrical welding bays to help prevent others looking at an electric arc or "welder's flash".
 | X | [ ]  | **Portable curtains**  |
| 1. Any hazardous waste materials or toxic dusts and gases resulting from this welding process are monitored.
 | X | [ ]  | **As per housekeeping and waste disposal procedures** |
| 1. Staff and member training is provided to minimise exposure to these hazards.
 | X | [ ]  | **Safety induction** |
| 1. “Safe Working Zones” are clearly defined. Where practical, all MIG welding activities are isolated away from others.
 | X | [ ]  | **Supervisor or JSA to address the requirements** |
| 1. All approved personal protective equipment (PPE) is used where required.
 | X | [ ]  | **All PPE is provided. As per SOP requirements** |
| 1. Specifically, approved protective gloves are worn in circumstances where plant operators’ hands could be exposed to extreme heat, friction, abrasion or chemical burns, etc.
 | X | [ ]  | **Specific PPE is provided as per SOP requirements**  |
| 1. Specifically, approved protective welding helmets and goggles, leather aprons, jackets and work boots are worn by all workers when operating any MIG welding plant and equipment.
 | X | [ ]  | **Specific PPE is provided as per SOP requirements**  |
| **Ergonomics and****Manual Handling:**Can the plant be safely operated, in a suitable location, providing clear and unobstructed access? Poorly designed work stations often necessitate teachers and students performing manual tasks involving heavy lifting and lowering, pushing, pulling or carrying, etc. Such tasks then contribute to a range of musculoskeletal sprains and strains for workers.  | 1. Where possible, practical welding benches are planned and adjusted to a comfortable work height thus minimising any unsafe or excessively strenuous manual tasks.
 | X | [ ]  | **Standing height non-flammable benches or stands to minimize manual handling of metal materials**  |
| 1. Sufficient workspace is provided in all practical workspaces and welding bays to help ensure unobstructed, safe operation.
 | X | [ ]  | **Supervisor or JSA to address the requirements** |
| 1. Floors are regularly cleaned and free of excessive wood dust, waste materials and other extraneous objects.
 | X | [ ]  | **As per housekeeping procedures** |
| 1. Staff training is provided with regard to manual handling techniques and procedures to minimise exposure to these hazards.
 | X | [ ]  | **General induction training and housekeeping procedures** |
| **Explosion and Fire:**As a consequence of using this particular item of plant and equipment, could anyone be injured by the release of stored energy triggered by volatile, explosive substances such as stored gasses, vapours or liquids? Could fire and explosion also result from a build-up of wood dust under the table saw, in the dust extraction system or in confined ceiling spaces? | 1. Fire extinguishers of the correct type are readily available in all workspaces and positioned near exit doorways.
 | X | [ ]  | **As per Australian Standards** |
| 1. Staff training is provided regarding procedures for the correct and appropriate use of fire safety equipment.
 | X | [ ]  | **Annual safety training** |
| 1. Exits from buildings and other work areas are defined and access to them kept clear of obstructions.
 | X | [ ]  | **As per Australian building code**  |
| 1. Safety signage is posted clearly denoting the location of all fire safety items and emergency exits.
 | X | [ ]  | **As per Australian building code** |

| **Other Hazards/Risks** | **Additional Control Measures***These would relate to the specific student needs, locations and conditions in which you are conducting your activity.* |
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| **Approval** |
| Submitted by: Simon McKellar | Date: 02/03/2020 |
| **[ ]**  | Approved as submitted. |
| **[ ]**  | Approved with the following condition(s):      |
| **[ ]**  | Not Approved for the following reason(s):      |
| By:       | Designation:       |
| Signed: | Date:        |

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| Staff members involved in the use of this risk assessment and the associated plant and equipment: |
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 | *Signature:*  ……………………………….. *Date:**Signature:*  ……………………………….. *Date:* *Signature:*  ……………………………….. *Date:* *Signature:*  ……………………………….. *Date:* *Signature:*  ……………………………….. *Date:* *Signature:*  ……………………………….. *Date:* *Signature:*  ……………………………….. *Date:* *Signature:*  ……………………………….. *Date:*  |

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| **Monitoring and Review***This Plant and Equipment Risk Assessment is to be monitored and reviewed annually for a further four (4) years.* |

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| **Review 1:** | **Yes**  | **No** |
| * Are allocated risk levels and “Actions required” unchanged over the past 12 months?
* Are Minimum Standards and Recommended Control Measures unchanged over 12 months?
* Staffing details have remained unchanged over the past 12 months?
 | [ ] [ ] [ ]  | [ ] [ ] [ ]  |
| If the responses are “NO” for any question, record current details here, and list all staff changes *(with signatures)* |
| Reviewed by:  | Designation:  |
| Signed: | Review Date :  |

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| **Review 2:** | **Yes**  | **No** |
| * Are allocated risk levels and “Actions required” unchanged over the past 12 months?
* Are Minimum Standards and Recommended Control Measures unchanged over 12 months?
* Staffing details have remained unchanged over the past 12 months?
 | [ ] [ ] [ ]  | [ ] [ ] [ ]  |
| If the responses are “NO” for any question, record current details here, and list all staff changes *(with signatures)* |
| Reviewed by:  | Designation:  |
| Signed: | Review Date :  |

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| **Review 3:** | **Yes**  | **No** |
| * Are allocated risk levels and “Actions required” unchanged over the past 12 months?
* Are Minimum Standards and Recommended Control Measures unchanged over 12 months?
* Staffing details have remained unchanged over the past 12 months?
 | [ ] [ ] [ ]  | [ ] [ ] [ ]  |
| If the responses are “NO” for any question, record current details here, and list all staff changes *(with signatures)* |
| Reviewed by:  | Designation:  |
| Signed: | Review Date :  |

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| **Review 4:** | **Yes**  | **No** |
| * Are allocated risk levels and “Actions required” unchanged over the past 12 months?
* Are Minimum Standards and Recommended Control Measures unchanged over 12 months?
* Staffing details have remained unchanged over the past 12 months?
 | [ ] [ ] [ ]  | [ ] [ ] [ ]  |
| If the responses are “NO” for any question, record current details here, and list all staff changes *(with signatures)* |
| Reviewed by:  | Designation:  |
| Signed: | Review Date :  |

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