##

**PLASMA CUTTER**

## Scope

This document is to be completed for staff and student use of machinery,
plant and equipment as a part of a school curriculum activity or program.

Refer to the [ITD Guidelines](http://education.qld.gov.au/health/pdfs/healthsafety/itd-staff-guidelines.pdf) for further staff advice on the risk management
process for practical ITD curriculum activities in schools.

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| Plant/Equipment Description:  |
| Teachers/Leaders:  |
| Room Locations:  |
| Assessment Date:  | Review Date:  |

*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 cutting thin or thick materials in a straight line, curved and angular shapes. Hand-held torches can effectively cut up to 40mm thick plate.
* When extreme care is taken to protect the operator from hot surfaces with all appropriate PPE.
* Plasma arcs are extremely hot – in the range of 25,000°C.
* When students are always under the appropriate supervision of a qualified ITD teacher.
* **NB:** It is recommended that junior students DO NOT have access to this welding equipment.
 | * A *Plant Risk Assessment* is required to be completed.
* Principal or Classified Officer (i.e. DP, HOD, HOC, HOSES) approval prior to conducting this activity is required.
* Obtaining parental permission is recommended.
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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.*  |
| --- |
|  [ ]  Registered teachers with experience, ability and competency in the safe use of this plant/equipment  *(indicate one or more of the following):*[ ]  Specific knowledge of the safe and correct use of this plant/equipment[ ]  Experience (i.e. previous involvement and familiarity) in the safe use of this plant/equipment[ ]  Demonstrated expertise, ability and competency with this plant/equipment[ ]  Documented qualifications relating to the use of this plant/equipment (e.g. in a staff profile) **OR** [ ]  An adult staff member or leader, other than a registered teacher, with:[ ]  Expertise in the safe and correct use of this plant/equipment[ ]  Documented qualifications that demonstrate experience, ability and competency in the safe use of this plant/equipment. |
|  [ ]  Will any ITD staff require initial and/or ongoing training for the safe use of this plant/equipment?If yes, give details:  |
|  [ ]  Will students be operating this plant/equipment?If yes, state how student use of this plant/equipment will be managed (e.g. Workshop Safety Induction)Give details:  |
|  Further information if required:  |
|  |
|  Minimum control requirements  |
|  Supporting documentation available in the school on this plant/equipment includes: [ ]  Operators Manual[ ]  Safe Operating Procedures (SOP)[ ]  Equipment Maintenance Records (EMR)[ ]  A process for recording student safety induction e.g. Student induction register [ ]  A process for recording staff training and experience, e.g. ITD Staff induction register |
|  [ ]  All guards are in place and in good working order for this plant/equipment  |
|  [ ]  Safe Working Zones are defined for this plant/equipment (e.g. yellow lines and/or appropriate signage)  |
|  [ ]  Suitable personal protective equipment (PPE) is available to be used by all operators |
|  [ ]  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 MMAW (or manual metal arc welders), are substituted or replaced with less hazardous alternatives.
 | [ ]  | [ ]  |  |
| 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.
 | [ ]  | [ ]  |  |
| 1. Staff and student training is provided to minimise exposure to these hazards and risks.
 | [ ]  | [ ]  |  |
| 1. Safe operating procedures (SOPs) are available and clearly displayed.
 | [ ]  | [ ]  |  |
| 1. Warning “Danger” tags (or similar) are affixed to all welding equipment under repair or maintenance preventing workers from using the equipment.
 | [ ]  | [ ]  |  |
| 1. “Safe Working Zones” are clearly defined. Where practical, all welding activities are isolated away from others.
 | [ ]  | [ ]  |  |
| 1. Operators are required to remove all jewellery, tuck in loose clothing and tie back long hair.
 | [ ]  | [ ]  |  |
| 1. All approved personal protective equipment (PPE) is used where required.
 | [ ]  | [ ]  |  |
| 1. Specifically, approved protective welding helmets and goggles, leather aprons, jackets, spats and work boots are worn by all workers when operating any welding plant and equipment.
 | [ ]  | [ ]  |  |
| **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 or gas lines and hoses, etc.
 | [ ]  | [ ]  |  |
| 1. Procedures are in place for the disposal of all waste materials around all plasma cutting or welding activities.
 | [ ]  | [ ]  |  |
| 1. Staff training is provided to minimise exposure to these hazards.
 | [ ]  | [ ]  |  |
| **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.
 | [ ]  | [ ]  |  |
| 1. All portable welding equipment maintenance is documented.
 | [ ]  | [ ]  |  |
| 1. Exposure to noisy ITD workshop environments is monitored and evaluated regularly for all workers.
 | [ ]  | [ ]  |  |
| 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.
 | [ ]  | [ ]  |  |
| 1. Staff and student training is provided to minimise exposure to these hazards.
 | [ ]  | [ ]  |  |
| 1. All ducted welding fume and dust extraction systems are fully maintained, cleaned and emptied, connected and operational.
 | [ ]  | [ ]  |  |
| 1. Good lighting is provided to all workspaces and this is maintained on a regular basis. Fluorescent tubes are checked and replaced as required.
 | [ ]  | [ ]  |  |
| 1. All approved personal protective equipment (PPE) is used where required.
 | [ ]  | [ ]  |  |
| **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.
 | [ ]  | [ ]  |  |
| 1. “Lock Out” or warning “Danger” tags are affixed to all electrical welding equipment under repair or maintenance preventing workers from using the equipment.
 | [ ]  | [ ]  |  |
| 1. Visually checks are made of all portable electrical welding equipment, their electrical switches, plugs and power leads, etc.
 | [ ]  | [ ]  |  |
| 1. Electrical safety inspections, testing and tagging, etc. are completed regularly as per guidelines for all portable electrical welding equipment.
 | [ ]  | [ ]  |  |
| 1. Electrical maintenance on all portable power tools is documented.
 | [ ]  | [ ]  |  |
| **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.
 | [ ]  | [ ]  |  |
| 1. Plant and machines likely to generate excessive heat or sparks are isolated, ventilated and monitored closely.
 | [ ]  | [ ]  |  |
| 1. All portable welding equipment maintenance is documented in a register.
 | [ ]  | [ ]  |  |
| 1. Welding bays are designed to allow for appropriate teacher supervision.
 | [ ]  | [ ]  |  |
| 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".
 | [ ]  | [ ]  |  |
| 1. Any hazardous waste materials or toxic dusts and gases resulting from this welding process are monitored.
 | [ ]  | [ ]  |  |
| 1. Staff and student training is provided to minimise exposure to these hazards.
 | [ ]  | [ ]  |  |
| 1. “Safe Working Zones” are clearly defined. Where practical, all welding activities are isolated away from others.
 | [ ]  | [ ]  |  |
| 1. All approved personal protective equipment (PPE) is used where required.
 | [ ]  | [ ]  |  |
| 1. Specifically, approved protective gloves are issued and worn in circumstances where plant operators’ hands could be exposed to extreme heat, friction, abrasion or chemical burns, etc.
 | [ ]  | [ ]  |  |
| 1. Specifically, protective welding helmets and goggles, leather aprons, jackets, spats and work boots are worn by all workers when operating any welding or plasma cutting plant and equipment.
 | [ ]  | [ ]  |  |
| **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.
 | [ ]  | [ ]  |  |
| 1. Sufficient workspace is provided in all practical workspaces and welding bays to help ensure unobstructed, safe operation.
 | [ ]  | [ ]  |  |
| 1. Floors are regularly cleaned and free of excessive waste materials and other extraneous objects.
 | [ ]  | [ ]  |  |
| 1. Staff training is provided with regard to manual handling techniques and procedures to minimise exposure to these hazards.
 | [ ]  | [ ]  |  |
| **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?  | 1. Fire extinguishers of the correct type are readily available in all workspaces and positioned near exit doorways.
 | [ ]  | [ ]  |  |
| 1. Staff training is provided regarding procedures for the correct and appropriate use of fire safety equipment.
 | [ ]  | [ ]  |  |
| 1. Exits from buildings and other work areas are defined and access to them kept clear of obstructions.
 | [ ]  | [ ]  |  |
| 1. Safety signage is posted clearly denoting the location of all fire safety items and emergency exits.
 |  |  |  |

| **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:       | Date:       |
| **[ ]**  | Approved as submitted. |
| **[ ]**  | Approved with the following condition(s):      |
| **[ ]**  | Not Approved for the following reason(s):      |
| By:       | Designation:       |
| Signed: | Date:        |

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| ITD 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?
* ITD staffing details at this school 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 :  |

|  |  |  |
| --- | --- | --- |
| **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?
* ITD staffing details at this school 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?
* ITD staffing details at this school 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?
* ITD staffing details at this school 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 :  |