

Metal Cutting Saws Plasma and Thermal Cutting

Business Name:		ABN:
Business Address:		
Contact Person:	Phone:	Email:

THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THIS PROJECT

Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.

Full Name:		
Signature:	Title:	Date:

CLIENT OR PRINCIPAL CONTRACTOR DETAILS

Client:	SCOPE OF WORKS
Project Name:	
Project Address:	
Project Manager:	
Contact Phone:	
Date Risk Assessment supplied to Project Manager:	

SAMPLE

RISK MATRIX									
LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC	SCORE	ACTION	HIERARCHY OF CONTROLS	
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE			Elimination Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	Substitution Replace the hazard.	
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Review before work starts.	Isolation Isolate People from the hazard	
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	2M MODERATE	Ensure control measures in place.	Engineering Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	Administrative Change	
								PPE	

Risk Rating & Required Action:	
4A	Stop work. The risk is intolerable. Eliminate the hazard or redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or higher-level authorisation is required.
3H	Review and approve additional controls for the task parts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.
1L	Proceed, following standard operating procedures. Monitor and keep records.

Consequence Scale:			
Consequence	People (injury/illness)	Project / Assets	Compliance / Reputation
Catastrophic	Fatality or permanent total disability	project shutdown	Significant regulator intervention; criminal prosecution
Major	Serious injury/illness (hospital > 5 days)	critical delay	Improvement notice; major media coverage
Moderate	Medical-treatment injury; lost-time > 1 day	moderate delay	Minor breach; adverse client comment
Minor	First-aid only, no lost time	negligible delay	Isolated non-conformance
Insignificant	No injury	no schedule impact	Deviation caught and corrected on site

Notes on Hierarchy of Controls:
Remember to apply controls in the preferred order shown by the coloured pyramid:

1. **Eliminate**
2. **Substitute**
3. **Isolate**
4. **Engineering**
5. **Administrative**
6. **PPE**

Always document **why** a lower-order control is accepted if elimination or substitution is not reasonably practicable.

aligned with Safe Work Australia's Managing the risk of fatigue at work (2023) and ISO 45001:2018 clauses 6–8.

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
1. WHS Governance, Roles and Legal Compliance	<ul style="list-style-type: none"> Lack of clear WHS responsibilities for metal cutting saws, plasma and thermal cutting operations Inadequate understanding of duties under WHS Act 2011 and WHS Regulations by officers and managers Absence of documented WHS policy specific to metal cutting and thermal cutting risks Failure to consult with workers and HSRs on changes to cutting processes or equipment No process for monitoring compliance with Australian Standards (e.g. AS/NZS 4024 series, AS 1674 hot work) Inadequate due diligence by officers regarding high-risk plant and hot work activities Poor integration of contractor WHS duties when external cutting services or maintenance are engaged 	4A	<ul style="list-style-type: none"> Establish and maintain a documented WHS governance framework that defines roles, responsibilities and accountabilities for all metal cutting, plasma and thermal cutting operations in line with WHS Act 2011 Develop a site-specific WHS policy that explicitly addresses plant safety, hot work, hazardous chemicals, and energy sources associated with metal cutting systems Ensure officers demonstrate due diligence by regularly reviewing risk assessments, plant registrations (where applicable), compliance records and WHS performance reports for cutting equipment Implement a formal consultation procedure with workers and Health and Safety Representatives (HSRs) for any introduction, modification or decommissioning of metal cutting and thermal cutting plant Integrate legislative and Australian Standards requirements into internal WHS procedures, including guarding, lockout, hot work, hazardous atmospheres and confined space interfaces Include WHS legal compliance obligations in senior management KPIs, with regular reporting to the executive or board on cutting-related risk controls and incidents Establish a contractor management procedure that requires verification of licences, insurances, SWMS and risk assessments for any external parties working on or operating cutting plant 	3H
2. Plant Procurement, Design and Modification Management	<ul style="list-style-type: none"> Procurement of metal cutting saws, plasma cutters or thermal cutting units without adequate safety features or compliance documentation Use of second-hand or modified plant with unknown history or undocumented alterations Poor integration of cold saws, metal bandsaws, power hacksaws and tube cutting machines into existing workshop layout Uncontrolled modifications or retrofits (e.g. guards removed for productivity, non-compliant automation upgrades) Lack of engineering review for high-energy plasma and thermal cutting systems, including fume extraction and power requirements 	4A	<ul style="list-style-type: none"> Implement a formal plant procurement procedure requiring risk-based specification of safety features (e.g. two-hand controls, interlocked guards, emergency stops, braking systems, blade enclosures, fume extraction compatibility) Require suppliers to provide declarations of conformity, manuals, maintenance schedules and evidence of compliance with relevant Australian Standards for all metal cutting and thermal cutting equipment Establish a design review and change management process for any modifications to cutting plant, ensuring engineering sign-off and updated risk assessments before use Prohibit use of plant with bypassed or removed safety devices through a documented non-conformance and isolation procedure Ensure workshop layout and electrical infrastructure are reviewed by competent persons prior to installing high-demand plasma or thermal cutting systems, including segregation of hot work and cold cutting areas Select low-noise, low-vibration equipment where reasonably practicable and specify integrated dust, chip and swarf capture systems at the design stage Standardise approved blades, cutting wheels, abrasives and consumables and maintain a controlled inventory system aligned with manufacturer specifications 	2M

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	<ul style="list-style-type: none"> Failure to consider noise, vibration and dust controls at design and procurement stage Inadequate compatibility assessment of tooling, blades, abrasives and consumables with plant specifications 			
3. Plant Guarding, Safety Interlocks and Engineering Controls	<ul style="list-style-type: none"> Inadequate fixed and interlocked guards on cold saws, bandsaws, power hacksaws and tube cutting machines Exposure to moving blades, rotating components, feed rollers and in-running nips due to poorly designed guarding Circumvention or failure of interlocks on access doors, blade covers or plasma cutting enclosures Inconsistent emergency stop locations and failure to test emergency stop functionality Lack of chip, swarf and offcut management systems leading to entanglement and cut injuries Insufficient extraction and shielding around plasma and thermal cutting arcs leading to UV/IR exposure and burns Over-reliance on PPE instead of engineering controls to manage high-severity mechanical and thermal hazards 	4A	<ul style="list-style-type: none"> Apply a plant guarding standard across all metal cutting plant in line with AS/NZS 4024 series, prioritising fixed physical barriers and interlocked guards over administrative controls Ensure all blade guards, covers and access doors on cold saws, bandsaws, hacksaws and tube cutting machines are interlocked so that the machine cannot operate when opened or incorrectly positioned Standardise emergency stop design and locations across the workshop and implement a scheduled functional testing program with documented records Install automatic chip, swarf and offcut removal or containment systems (e.g. conveyors, trays, magnetic separators) to minimise manual clearing near moving parts Use engineering controls such as light curtains, presence-sensing devices and perimeter guarding where automated or high-volume metal cutting tasks present higher entanglement risk For plasma and thermal cutting, implement shielding, screens and enclosures designed to control UV/IR radiation, sparks and molten metal spatter, integrated with appropriate extraction systems Establish a formal guard integrity inspection program, including tamper-proof fastenings and escalation procedures if guards or interlocks are found defective or bypassed 	2M
4. Isolation, Lockout/Tagout and Energy Control Systems	<ul style="list-style-type: none"> Uncontrolled release of mechanical, electrical, pneumatic or hydraulic energy during maintenance or jam clearing Workers reaching into cutting zones of cold saws, bandsaws or power hacksaws without proper isolation Failure to isolate plasma power sources, gas supplies and compressed air systems before service work Inconsistent lockout/tagout practices across shifts, contractors and different cutting machines 	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> Absence of try-start or verification steps following isolation of cutting plant Shared energy sources not clearly identified between multiple metal cutting machines Non-standard or unauthorised isolation devices being used 		[REDACTED]	
5. Competency, Licensing and Training Systems	<ul style="list-style-type: none"> Inadequate competency of operators using cold saws, metal bandsaws, power hacksaws and tube cutting machines Operators unfamiliar with high-risk characteristics of plasma and thermal cutting, including fume generation and fire potential No formal verification of training for new starters, labour hire or contractors performing steel cutting operations Absence of refresher training leading to skill fade and normalisation of unsafe shortcuts Lack of documented competency assessments for supervisors overseeing high-volume metal cutting tasks Inconsistent understanding of emergency response, isolation procedures and defect reporting Failure to provide training on material-specific hazards (e.g. coatings, galvanised steel, stainless fume hazards) 	4A	[REDACTED]	2M
6. Maintenance, Inspection and Asset Management	<ul style="list-style-type: none"> Degraded or poorly maintained cold saws, bandsaws, hacksaws and tube cutting machines leading to mechanical failure Worn or damaged blades, bands, cutting wheels and consumables increasing risk of breakage or kickback Unserviced plasma and thermal cutting equipment resulting in electrical faults, gas leaks or unstable arcs 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> • Non-functional guarding, interlocks, emergency stops and extraction systems due to lack of preventative maintenance • Unrecorded breakdown repairs leading to undocumented changes or partial fixes • Irregular calibration or testing of safety-critical components • Failure to respond promptly to reported plant defects or abnormal noise, vibration or heat 		[REDACTED]	
7. Workshop Layout, Traffic Management and Access Control	<ul style="list-style-type: none"> • Poor separation between metal cutting areas, pedestrian routes and mobile plant traffic • Inadequate space around cold saws, bandsaws and plasma tables leading to awkward handling and crush or strike-by hazards • Uncontrolled access to plasma and thermal cutting zones by untrained personnel or visitors • Inadequate storage systems for bar stock, metal sheet, tubes and offcuts causing trip and collapse risks • Shared work zones for cutting and grinding metal sheets without effective segregation of sparks and hot particles • Insufficient lighting around cutting stations leading to errors and near misses • Blocked access to emergency exits, fire equipment, isolation points or first aid facilities 	3H	[REDACTED]	2M
8. Hot Work, Fire and Explosion Risk Management	<ul style="list-style-type: none"> • Ignition of combustible materials from sparks, molten metal or hot surfaces during plasma and thermal cutting • Fire spread from cutting and grinding metal sheets near flammable liquids, combustible dusts or packaging 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> Inadequate control of hot work permits in non-designated areas Cutting into unknown or contaminated metal (e.g. fuel tanks, drums, coated steel) with trapped flammable vapours Lack of monitoring for hot spots and smouldering materials after cutting activities Inappropriate storage or use of gas cylinders near ignition sources Inadequate fire detection, suppression and emergency response capability in cutting areas 		[REDACTED]	
9. Fume, Dust, Noise and Illness Prevention Systems	<ul style="list-style-type: none"> Inhalation of welding-type fumes from plasma and thermal cutting of coated, galvanised or alloy steels Accumulation of metal dust and particulates from cutting and grinding metal sheets High noise levels from cold saws, bandsaws and grinding operations contributing to noise induced hearing loss Inadequate general ventilation and local exhaust ventilation (LEV) in cutting booths and booths Poor maintenance of fume and extraction equipment leading to reduced performance and environmental contamination Failure to manage exposure to hazardous substances generated during cutting (e.g. hexavalent chromium, manganese) as per SDS and WHS Regulations Over-reliance on PPE without exposure monitoring or hierarchy-of-control assessment 	4A	[REDACTED]	2M

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10. Material Handling, Ergonomics and Manual Tasks Management	<ul style="list-style-type: none"> Manual handling of heavy steel bar, metal sheets, tubes and offcuts associated with cutting operations Awkward postures and repetitive movements while feeding material into cold saws, bandsaws and tube cutting machines Crush and pinch injuries from poorly controlled use of cranes, hoists or forklifts to load cutting machines Lack of standardised jigs, roller beds or supports for long stock, leading to drooping, kickback or instability Inadequate systems for segregating, stacking and removing scrap and offcuts from high-volume cutting areas No systematic approach to assessing and controlling manual tasks risks for cutting and grinding operations Fatigue and musculoskeletal strain from extended periods of repetitive cutting or grinding work 	3H	[REDACTED]	2M
11. Operating Procedures, Permits and Work Planning	<ul style="list-style-type: none"> Inconsistent operating practices between shifts and operators for cold cutting and steel cutting operations Lack of documented procedures for high-volume metal cutting tasks, including change-over, start-up and shutdown sequences (from operator perspective) Commencement of cutting and grinding work without adequate pre-planning or verification of preconditions (materials, permits, isolation, ventilation) No structured system for scheduling and prioritising cutting work, leading to rushed jobs and bypassing of controls Inadequate integration of cold cutting, plasma cutting and grinding tasks, resulting in overlapping incompatible activities 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> Failure to control non-routine or one-off cutting tasks through permits or specific risk assessments Over-dependence on individual operator judgement rather than standardised procedures 		[REDACTED]	
12. Contractor and Labour Hire Management	<ul style="list-style-type: none"> Contractors operating cutting and grinding equipment without alignment to site WHS systems Labour hire workers inadequately inducted into metal cutting saws and plasma cutting risks Conflicting procedures between principal contractor and subcontractors for hot work and plant isolation Inadequate supervision of contractors undertaking maintenance on cutting machines or extraction systems Lack of clarity regarding provision and maintenance of equipment, PPE and emergency response responsibilities Failure to verify the quality of contractor SWMS and risk assessments for steel cutting operations Language or cultural barriers leading to misunderstanding of WHS expectations 	3H	[REDACTED]	2M
13. Incident Reporting, Investigation and Corrective Action	<ul style="list-style-type: none"> Under-reporting of near misses and minor injuries related to metal cutting and grinding operations Failure to identify systemic causes of incidents involving plant, hot work and fumes Inconsistent investigation quality between departments or supervisors Delays in implementing corrective actions for known cutting plant hazards Lack of feedback to workers on lessons learned from incidents and audits 	3H	[REDACTED]	1L

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	<ul style="list-style-type: none"> • Incomplete documentation leading to poor regulatory defensibility and limited trend analysis • Repeat incidents in high-volume steel cutting areas due to weak close-out processes 		[REDACTED]	
14. Emergency Preparedness and Response for Cutting Operations	<ul style="list-style-type: none"> • Delayed or ineffective response to injuries from blades, hot metal or fume inhalation • Workers and supervisors unsure how to respond to fire, explosion or electrical faults in cutting equipment • Insufficient first aid equipment and trained first aiders for high-risk cutting and grinding environments • Inadequate planning for power outages or failures of extraction systems during plasma and thermal cutting • Poor communication and evacuation processes in noisy workshop environments • Lack of coordination with external emergency services regarding specific cutting and hot work hazards • Failure to test and review emergency procedures after changes to layout or introduction of new cutting plant 	3H	[REDACTED]	1L
15. Health Monitoring, Fitness for Work and Fatigue Management	<ul style="list-style-type: none"> • Cumulative health effects from long-term exposure to metal fumes, dust and noise from cutting operations • Fatigue or impairment contributing to poor decision-making when operating metal cutting saws and plasma cutters • Unmanaged medical conditions that may affect safe plant operation (e.g. epilepsy, serious visual impairments) • Exposure of vulnerable workers (e.g. young, inexperienced, or new to the industry) to high-risk cutting tasks without monitoring 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> Lack of systems to identify and manage drug and alcohol risks in high-risk plant environments Insufficient follow-up on health issues identified through surveillance or incident reports 		[REDACTED]	
16. Documentation, Records and Continuous Improvement	<ul style="list-style-type: none"> Outdated or missing risk assessments and procedures for metal cutting, plasma and thermal cutting operations Inconsistent version control of SOPs, permits and checklists across departments or sites Inability to demonstrate compliance with WHS Act 2011 and associated Regulations due to poor recordkeeping Loss of critical plant maintenance, inspection, training and incident records Lack of formal review cycles for the WHS management system covering cutting operations Failure to incorporate feedback and audit findings into system improvement Overly complex or obsolete WHS documentation leading to non-use by frontline workers 	3H	[REDACTED]	1L

SAMPLE

EMERGENCY RESPONSE – CALL 000 FOR EMERGENCIES

Ensure to have an Emergency Management Plan in place as well as adequate numbers of trained first aid staff with easy access to fully stocked first aid kits, rescue equipment, material safety data sheets, adequate access to emergency communication equipment and fire-fighting equipment suitable for all classes of fire and ignition sources.

LEGISLATIVE REFERENCES

RELEVANT LEGISLATION AND CODES OF PRACTICE. DELETE THE LEGISLATIVE REFERENCES FOR ANY STATE THAT ARE NOT APPLICABLE

Queensland & Australian Capital Territory

Work Health and Safety Act 2011
 Work Health and Safety Regulations 2011
 Legislation QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws>
 Codes of Practice QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice>
 Legislation ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/acts-and-regulations>
 Codes of Practice ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/codes-of-practice>

Victoria

Occupational Health and Safety Act 2004
 Occupational Health and Safety Regulations 2017
 Legislation VIC: <https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations>
 Codes of Practice VIC: <https://www.worksafe.vic.gov.au/compliance-codes-and-codes-practice>

New South Wales

Work Health and Safety Act 2011
 Work Health and Safety Regulations 2025
 Legislation NSW: <https://www.safework.nsw.gov.au/legal-obligations/legislation>
 Codes of Practice NSW: <https://www.safework.nsw.gov.au/resource-library/list-codes-of-practice>

Western Australia

Work Health and Safety Act 2020
 Work Health and Safety Regulations 2022
 Legislation Western Australia: <https://www.commerce.wa.gov.au/worksafe/legislation>
 Codes of Practice WA: <https://www.commerce.wa.gov.au/worksafe/codes-practice>

Northern Territory

Work Health and Safety (National Uniform Legislation) Act 2011
 Work Health and Safety (National Uniform Legislation) Regulation 2011
 Legislation NT: <https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws>
 Codes of Practice NT: <https://worksafe.nt.gov.au/laws-and-compliance/codes-of-practice>

Safe Work Australia Links

Law and Regulation (All States): <https://www.safeworkaustralia.gov.au/law-and-regulation>
 Model Codes of Practice: <https://www.safeworkaustralia.gov.au/resources-publications/model-codes-of-practice>

South Australia

Work Health and Safety Act 2012 (SA)
 Work Health and Safety Regulations 2012 (SA)
 Legislation for SA: <https://www.safework.sa.gov.au/resources/legislation>
 Codes of Practice for SA: <https://www.safework.sa.gov.au/workplaces/codes-of-practice#COPs>

Model Codes of Practice

- Managing noise and preventing hearing loss at work
- Confined spaces
- Labelling of workplace hazardous chemicals
- Managing risks of hazardous chemicals in the workplace
- Welding processes
- First aid in the workplace
- Managing the risk of falls at workplaces
- Hazardous manual tasks
- Managing the risk of falls in housing construction
- Managing electrical risks in the workplace
- Demolition work
- Excavation work
- Work health and safety consultation, cooperation and coordination
- Managing the work environment and facilities
- How to manage work health and safety risks
- Managing risks of plant in the workplace
- Construction work

Tasmania

Work Health and Safety Act 2012
 Work Health and Safety (Transitional and Consequential Provisions) Act 2012
 Work Health and Safety Regulations 2012
 Work Health and Safety (Transitional) Regulations 2012
 Legislation for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/acts-and-regulations>
 Codes of Practice for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/codes-of-practice>

Details of permits, licenses or access required by regulatory bodies (add or delete as required):

- Permits from local council
- Authorisation to commence work
- Any required documents.