

Oxy-Fuel Gas Welding

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			<b>Elimination</b> Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	<b>Substitution</b> 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.	<b>Engineering</b> 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:	
<b>4A</b>	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.
<b>3H</b>	Review and approve additional controls before task starts. Senior supervisor sign-off needed.
<b>2M</b>	Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.
<b>1L</b>	Proceed, following standard operating procedures. Monitor and keep records.

  

Consequence Scale:			
Consequence	People (injury/illness)	Project / Assets	Compliance / Reputation
<b>Catastrophic</b>	Fatality or permanent total disability	project shutdown	Significant regulator intervention; criminal prosecution
<b>Major</b>	Serious injury/illness (hospital > 5 days)	critical delay	Improvement notice; major media coverage
<b>Moderate</b>	Medical-treatment injury; lost-time > 1 day	moderate delay	Minor breach; adverse client comment
<b>Minor</b>	First-aid only, no lost time	negligible delay	Isolated non-conformance
<b>Insignificant</b>	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. Governance, WHS Duties and Legislative Compliance	<ul style="list-style-type: none"> <li>Lack of clear allocation of WHS duties for oxy-fuel gas welding under WHS Act 2011 and WHS Regulations 2011</li> <li>Inadequate understanding by Officers of due diligence obligations relating to hazardous chemicals and plant (oxy-fuel equipment)</li> <li>Absence of formal WHS policy and specific procedure addressing oxy-fuel gas welding risks (fire, explosion, asphyxiation, burns, manual handling, environment)</li> <li>Failure to consult workers and health and safety representatives (HSRs) on oxy-fuel welding risk controls and changes to systems of work</li> <li>Non-compliance with applicable Australian Standards (e.g. AS 4839, AS 4289, AS 4332, AS 1674.1, AS/NZS 60079 series for hazardous areas where relevant)</li> <li>Poor integration of oxy-fuel welding risks into the organisation's WHS management system, risk register and objectives</li> <li>Inadequate contractor management where third-party welders use oxy-fuel equipment on site</li> <li>Lack of documented authorisation for use of oxy-fuel gas welding in high-risk or confined environments</li> </ul>	High	<ul style="list-style-type: none"> <li>Establish and maintain a WHS management system that explicitly incorporates oxy-fuel gas welding, aligned with WHS Act 2011, WHS Regulations 2011 and relevant Codes of Practice (e.g. Managing Risks of Hazardous Chemicals in the Workplace, Managing Risks of Plant in the Workplace, Welding Processes)</li> <li>Define and document WHS roles, responsibilities and accountabilities for Persons Conducting a Business or Undertaking (PCBUs), Officers, managers, supervisors and workers in relation to oxy-fuel gas welding activities</li> <li>Develop and approve an organisation-wide Oxy-fuel Gas Welding Policy that sets minimum safety expectations for design, procurement, storage, use, inspection, maintenance and decommissioning of oxy-fuel systems</li> <li>Ensure Officers exercise due diligence by regularly reviewing oxy-fuel welding risk information, audit results, incident trends and verifying resourcing for controls</li> <li>Implement a formal consultation procedure requiring engagement with workers and HSRs prior to introduction of significant change to oxy-fuel welding equipment, processes or locations</li> <li>Embed oxy-fuel welding hazards and controls into the corporate risk register, with defined risk owners, review frequencies and escalation triggers</li> <li>Develop and implement a contractor management procedure that requires contractors to demonstrate equivalent oxy-fuel gas welding controls, competency, insurances and safe systems of work prior to engagement</li> <li>Establish a documented authorisation/permit system for higher-risk oxy-fuel welding (e.g. hot work permits, confined space entry permits, work near flammable atmospheres) including clear approval levels</li> <li>Periodically review legal and standard requirements (including Australian Standards) and update internal procedures and training content to maintain compliance</li> <li>Integrate oxy-fuel welding risk controls into broader WHS plans, KPIs and continuous improvement processes, with scheduled management review meetings</li> </ul>	Medium
2. Procurement, Design and Specification of Oxy-Fuel Systems	<ul style="list-style-type: none"> <li>Procurement of non-compliant or poor-quality oxy-fuel equipment, hoses, regulators and flashback arrestors</li> <li>Lack of engineering input into system design, leading to incompatible components and unsafe configurations</li> <li>Absence of documented technical specifications and acceptance criteria for oxy-fuel gas welding plant and components</li> </ul>	High	<ul style="list-style-type: none"> <li>Develop and enforce a formal oxy-fuel equipment procurement standard that references relevant Australian Standards, manufacturer requirements and gas supplier specifications</li> <li>Engage competent persons (e.g. engineers, senior welders, gas supplier technical representatives) in specifying oxy-fuel systems, including regulators, hoses, torches, flashback arrestors and cylinder manifolds</li> <li>Use an approved supplier list for oxy-fuel gas equipment, with suppliers required to provide evidence of compliance (test certificates, conformity to standards, warranties and service support)</li> <li>Standardise brands and models of key oxy-fuel system components to minimise interface issues, simplify training and streamline spare parts management</li> </ul>	Medium

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	<ul style="list-style-type: none"> <li>Failure to ensure cylinders, manifolds and distribution systems are compliant with relevant Australian Standards and gas supplier requirements</li> <li>Purchasing decisions based solely on cost without lifecycle safety, reliability and maintenance considerations</li> <li>Inadequate assessment of suitability of equipment for the type of work, environment (indoor, outdoor, confined) and gas types used</li> <li>Use of equipment not rated for pressures, temperatures or gas types involved, increasing likelihood of leaks, flashbacks and failure</li> <li>Inconsistent procurement leading to multiple incompatible fittings, connectors and spare parts across the workplace</li> </ul>		<ul style="list-style-type: none"> <li>Include safety features as mandatory procurement criteria (e.g. non-return valves, flashback arrestors at both regulator and torch, colour-coded and date-stamped hoses)</li> <li>Require formal pre-acceptance inspections and commissioning checks against procurement specifications prior to releasing new oxy-fuel equipment into service</li> <li>Specify that all supplied plant and equipment comes with manufacturer instructions, safety data, maintenance schedules and training material for integration into WHS systems</li> <li>Document and maintain an asset register for oxy-fuel systems including serial numbers, locations, service history and retirement dates</li> <li>Ensure any modifications or custom designs are subject to risk assessment, engineering review and, where required, verification by a competent person</li> <li>Embed procurement controls into purchasing workflows (e.g. purchase order templates, sign-off by WHS/engineering) to prevent ad-hoc purchase of non-compliant equipment</li> </ul>	
3. Hazard Identification, Risk Assessment and Planning	<ul style="list-style-type: none"> <li>Oxy-fuel welding hazards not systematically identified across all work areas and scenarios (maintenance, fabrication, site work, confined spaces)</li> <li>Risk assessments focusing only on task steps and not on system-level issues such as gas supply, storage, emergency response and equipment</li> <li>Failure to consider interface risks with other work activities (hot work near flammable liquids, painting, welding, contractor works)</li> <li>Inadequate assessment of environmental conditions (ventilation, weather, heat sources, combustible materials, hazardous areas) prior to authorising welding work</li> <li>No formal planning for high-risk operations such as confined space welding, elevated work, or work on process plant</li> <li>Risk control decisions made informally without documentation, consultation or approval</li> </ul>	High	<ul style="list-style-type: none"> <li>Implement a structured risk management procedure for oxy-fuel gas welding aligned with WHS regulation Part 3.1 (Managing Risks to Health and Safety)</li> <li>Require formal, documented risk assessments for oxy-fuel welding tasks at each distinct work location, considering system-level hazards (gas supply, storage, emergency access, interactions with other plant)</li> <li>Include multidisciplinary participation (supervisors, welders, WHS advisors, maintenance, fire safety representatives) in risk identification and control selection</li> <li>Integrate oxy-fuel welding risks into site-wide hazard identification processes such as inspections, audits, pre-start meetings and safety observations</li> <li>Mandate pre-job planning processes (e.g. Job Safety Analysis or similar planning document) for complex or high-risk oxy-fuel welding activities, referencing the overarching risk assessments and permits</li> <li>Ensure risk assessments explicitly address ignition sources, flammable atmospheres, oxygen-enriched atmospheres, confined spaces, working at height, nearby combustible materials and interactions with other trades</li> <li>Set review triggers for risk assessments including incident occurrence, near misses, plant modifications, process changes and audit findings</li> <li>Store risk assessments in a central, controlled document management system accessible to all relevant personnel and contractors</li> <li>Provide guidance material and templates that prompt assessment of systemic issues (supervision, communication, fatigue, shift work, contractor coordination) related to oxy-fuel welding</li> <li>Monitor implementation and effectiveness of controls identified in risk assessments through inspections, KPIs and management review</li> </ul>	Medium



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	<ul style="list-style-type: none"> <li>Uncontrolled movement and transport of cylinders within the workplace, including manual handling injuries and cylinder falls</li> <li>Lack of cylinder tracking leading to unknown ownership, overdue inspections or unaccounted hazardous gas inventory</li> <li>Inaccurate labelling or identification of cylinders and gas lines creating risk of mis-connection and incorrect gas use</li> <li>Storage of cylinders in egress routes or areas needed for emergency evacuation and firefighting access</li> <li>Failure to manage empty, part-used and full cylinders systematically, increasing confusion and handling errors</li> </ul>		[REDACTED]	
6. Equipment Inspection, Maintenance and Asset Management	<ul style="list-style-type: none"> <li>Failure of regulators, flashback arrestors and torches due to lack of preventive maintenance and inspection</li> <li>Use of damaged, perished or incompatible hoses and fittings lead to gas leaks and flashbacks</li> <li>Over-reliance on ad-hoc repairs instead of a structured maintenance program</li> <li>No system to ensure flashback arrestors and regulators are replaced or serviced in accordance with manufacturer recommendations</li> <li>Unrecorded repairs and modifications to oxy-fuel equipment introducing unrecognised risks</li> <li>Deficient calibration and performance verification after maintenance work</li> </ul>	High	[REDACTED]	Low

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	<ul style="list-style-type: none"> <li>Lack of clear criteria for removing damaged or obsolete oxy-fuel equipment from service</li> </ul>		[REDACTED]	
7. Work Environment, Layout and Infrastructure	<ul style="list-style-type: none"> <li>Inadequate fixed ventilation or extraction systems leading to accumulation of fumes, gases or oxygen-enriched atmospheres</li> <li>Cluttered work areas and poor housekeeping around oxy-fuel welding zones increasing fire load and trip hazards</li> <li>Oxy-fuel workstations located too close to combustible construction materials, flammable liquids, gas cylinders or electrical installations</li> <li>Lack of designated welding bays or screens causing exposure of other workers to sparks, hot slag and radiation from other welding processes</li> <li>Insufficient separation of off-street (vehicles, forklifts) from oxy-fuel welding and cylinder storage areas</li> <li>Inappropriate surface finishes or building materials that increase fire spread potential in welding areas</li> <li>Inadequate fixed fire protection systems (e.g. detection, suppression, hydrants) in areas of heavy oxy-fuel use</li> </ul>	High	[REDACTED]	Medium

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8. Hot Work Permits, Authorisation and Work Coordination	<ul style="list-style-type: none"> <li>• Oxy-fuel welding undertaken without formal authorisation in high-risk conditions or locations</li> <li>• Inadequate hot work permit system failing to identify nearby flammable or combustible hazards and conflicting work</li> <li>• Poor coordination between multiple work groups or contractors leading to overlapping hot work and uncontrolled ignition risks</li> <li>• Permits treated as administrative rather than risk management tools, resulting in superficial checks and sign-offs</li> <li>• Failure to consider follow-on risks such as smouldering materials and re-ignition after completion of oxy-fuel work</li> <li>• Inconsistent application of permits across shifts, sites or supervisors leading to variable safety outcomes</li> </ul>	High	<p>[REDACTED]</p>	Medium
9. Emergency Preparedness, Fire Protection and Incident Management	<ul style="list-style-type: none"> <li>• Inadequate planning for fires, explosions, flashbacks, gas leaks or burns associated with oxy-fuel welding</li> <li>• Insufficient fire-fighting equipment (type, quantity, placement) for the nature and scale of oxy-fuel operations</li> <li>• Workers unaware of emergency shutdown procedures for gas supplies and cylinders</li> <li>• Unclear or untested response procedures for gas leaks, cylinder failures or manifold incidents</li> </ul>	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Medium

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	<ul style="list-style-type: none"> <li>• Delayed or ineffective communication with emergency services due to lack of information, site plans or contacts</li> <li>• Inadequate post-incident investigation leading to recurrence of systemic oxy-fuel related failures</li> </ul>		<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	
10. Documentation, Records and Information Management	<ul style="list-style-type: none"> <li>• Critical information about oxy-fuel systems, hazards and controls not readily available to workers, supervisors and contractors</li> <li>• Outdated or conflicting procedures, instructions and drawings leading to inconsistent practices</li> <li>• Lack of retention of key records such as training, maintenance records, permits and incidents impeding compliance demonstration</li> <li>• Uncontrolled use of informal notes, photos or verbal instructions instead of approved documentation</li> <li>• Poor version control and document approval processes resulting in unauthorised changes to safety-critical oxy-fuel procedures</li> </ul>	Medium	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Low

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			[REDACTED]	
11. Contractor, Visitor and Third-Party Interface Management	<ul style="list-style-type: none"> <li>Contract welders using oxy-fuel systems with safety standards lower than the host organisation's requirements</li> <li>Lack of clarity about who controls and supervises oxy-fuel activities performed by contractors on site</li> <li>Visitors and other third parties inadvertently entering oxy-fuel welding or cylinder storage areas</li> <li>Conflicting procedures between client and contractor leading to confusion and non-compliance</li> <li>Insufficient pre-qualification of contractors regarding oxy-fuel competency, equipment standards and emergency arrangements</li> </ul>	High	[REDACTED]	Medium
12. Monitoring, Review and Continuous Improvement	<ul style="list-style-type: none"> <li>Static oxy-fuel safety systems that do not adapt to changes in operations, technology or legislation</li> <li>Lack of performance monitoring, leading to undetected deterioration in oxy-fuel safety standards</li> </ul>	Medium	[REDACTED]	Low

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	<ul style="list-style-type: none"> <li>• Failure to act on audit findings, incident learnings and worker feedback related to oxy-fuel welding</li> <li>• Inadequate integration of oxy-fuel indicators into corporate WHS performance measures</li> <li>• Over-reliance on absence of incidents as a measure of effective oxy-fuel risk control</li> </ul>		<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	

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.