

**Engineering Machining Lathe and Milling Operations**

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:	



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 for the task parts. 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. WHS Governance, Duties and Consultation	<ul style="list-style-type: none"> <li>Lack of documented WHS governance structure for machining operations leading to unclear legal duties under WHS Act 2011</li> <li>Inadequate consultation with workers and Health and Safety Representatives (HSRs) about machining and lathe risks</li> <li>Board and senior management not receiving regular WHS performance reports specific to machining activities</li> <li>Failure to integrate WHS legal changes or updated Australian Standards for machine safety into site procedures</li> <li>No formal process for due diligence by Officers in relation to high-risk plant such as lathes, mills and grinders</li> </ul>	4A	<ul style="list-style-type: none"> <li>Establish and document a WHS governance framework that clearly allocates PCBU, Officer, Manager and Supervisor responsibilities for machining plant in line with WHS Act 2011 and WHS Regulation</li> <li>Implement a formal WHS consultation procedure that includes regular toolbox talks and Committee/HSR meetings focused on machining, lathes, milling and grinding activities</li> <li>Provide due diligence training for Officers emphasising obligations relating to high-risk plant, guarding, isolation and competent requirements</li> <li>Schedule quarterly WHS performance reviews on machining operations, including incident trends, near misses, audit findings and isolation close-out rates</li> <li>Establish a legal and standards register for plant safety (e.g. AS 4024 series, electrical and guarding standards) with a process to review, update and incorporate requirements into internal procedures</li> </ul>	3H
2. Plant Procurement, Design and Guarding Standards	<ul style="list-style-type: none"> <li>Purchasing lathes, mills, end-mills, line borers and grinders without compliant fixed guarding or emergency stop systems</li> <li>Use of non-CE/AS certified retrofitted parts or DIY modifications to defeat guarding or interlocks</li> <li>Inadequate guarding design for rotating chucks, lead screws, belts and pulleys, cutting heads and pinch points</li> <li>Lack of standardisation across different machine brands and ages leading to inconsistent safety features and user interfaces</li> <li>Failure to consider ergonomic design (reach distances, visibility, access for cleaning) during procurement process</li> </ul>	4A	<ul style="list-style-type: none"> <li>Develop and enforce a plant procurement standard that mandates compliance with relevant Australian Standards (e.g. AS 4024 Safety of Machinery) and WHS Regulation before purchase or hire</li> <li>Require pre-purchase safety evaluations and documented risk assessments for all new and second-hand lathes, milling machines, end-mill machines, line borers and grinders</li> <li>Specify design requirements for physical guarding, interlock systems, emergency stop devices, chuck guards, spindle covers and chip shields in all purchase contracts</li> <li>Implement a plant variation and modification procedure ensuring any mechanical, electrical or software change is risk assessed, approved by a competent person and re-verified for safety</li> <li>Standardise, where practicable, machine models and control layouts to support consistent guarding, spares, training and safe operating procedures</li> </ul>	2M
3. Installation, Commissioning and Verification of Machining Plant	<ul style="list-style-type: none"> <li>Incorrect anchoring or levelling of lathes and milling machines leading to vibration, instability and potential ejection of workpieces</li> <li>Inadequate electrical installation or earthing creating risk of electric shock or fire</li> </ul>	4A	<ul style="list-style-type: none"> <li>Use competent, licensed tradespeople and OEM-approved contractors for installation of all lathes, milling machines, line borers and grinders, with installation signed off against manufacturer requirements</li> <li>Implement a commissioning procedure requiring functional testing of all safety devices (guards, interlocks, e-stops, overload protection, isolation points) with results recorded and retained</li> <li>Conduct pre-use workplace risk verification after installation to confirm layout, access, lighting, ventilation, noise and traffic separation controls are suitable</li> </ul>	2M

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	<ul style="list-style-type: none"> <li>Failure to commission and verify interlocks, emergency stops, guarding and safety PLC logic on interactive machining centres</li> <li>Commissioning conducted without formal documentation, leaving unknown residual risks and undocumented limitations</li> <li>Insufficient validation that extraction systems and coolant delivery meet design and exposure assumptions</li> </ul>		<ul style="list-style-type: none"> <li>Ensure electrical installations comply with AS/NZS 3000 and are subject to verification and test tagging before machines are energised</li> <li>Require commissioning reports to identify any residual constraints or special conditions of use and incorporate these into safe operating procedures and training materials</li> </ul>	
4. Layout, Traffic Management and Work Environment in Machine Shop	<ul style="list-style-type: none"> <li>Poor workshop layout resulting in pedestrians moving through machining zones and forklift routes near rotating equipment</li> <li>Inadequate separation between lathes, mills, line borers and grinders leading to entanglement or collision risks when long workpieces are handled</li> <li>Insufficient lighting causing misjudgement of clearances, incorrect tool setting or poor visibility of rotating components</li> <li>Inadequate control of noise, airborne metal particulates, oil mist and welding fumes from adjacent areas</li> <li>Restricted access and cluttered floor increasing slip, trip and fall risk near rotating machinery</li> </ul>	3H	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M
5. Competency, Licensing, Training and Authorisation for Machining	<ul style="list-style-type: none"> <li>Untrained or partially trained workers operating lathes, milling machines, line borers and grinders</li> <li>No formal competency assessment for complex operations such as interactive machining, metal spinning or multi-axis milling</li> <li>Inadequate supervision of apprentices, trainees or labour-hire workers performing machining tasks</li> <li>Training focused on production outcomes rather than hazard</li> </ul>	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> <li>recognition, emergency response and safe use of guarding systems</li> <li>• Out-of-date training materials not reflecting current machine controls, software, interlocks or incident learnings</li> </ul>		[REDACTED]	
6. Safe Operating Procedures, Work Instructions and Change Control	<ul style="list-style-type: none"> <li>• Absence of documented safe operating procedures (SOPs) for specific machine types such as engine lathes, turret lathes, milling machines and grinders</li> <li>• SOPs focusing only on basic steps and not addressing system controls such as isolation, guarding, workpiece set-up and verification checks</li> <li>• Procedures not reflecting actual practice, leading to informal work-arounds and normalisation of deviance</li> <li>• Lack of formal document control resulting in multiple, conflicting versions of machining instructions across the site</li> <li>• Uncontrolled introduction of new machining methods or tooling without risk assessment (e.g. manual spinning techniques, interactive machining programs)</li> </ul>	3H	[REDACTED]	2M
7. Workpiece, Tooling and Workholding Management	<ul style="list-style-type: none"> <li>• Inadequate systems for selecting and maintaining cutting tools, chucks, collets, centres and fixtures appropriate to the task</li> <li>• Use of damaged or incompatible tool holders, chucks or faceplates increasing risk of tool or workpiece ejection</li> <li>• Poor control of long bar stock, unbalanced workpieces or off-centre loads on lathes and mills</li> <li>• Lack of documented limits for spindle speeds, feeds and depth of cut for specific materials and machine capacities</li> <li>• No formal inspection regime for critical workholding equipment such as lifting attachments, mandrels and steady rests</li> </ul>	4A	[REDACTED]	2M

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8. Machine Guarding, Interlocks and Safety Devices Management	<ul style="list-style-type: none"> <li>Machine guards left open, removed or defeated without system-level controls to prevent operation</li> <li>Interlocks bypassed using magnets, jumpers or software overrides, normalised by production pressure</li> <li>Emergency stop buttons, foot pedals or guarding switches not tested or maintained, leading to failure on demand</li> <li>No preventive maintenance schedule for guards, hinges, viewing panels and safety switches on lathes, mills and grinders</li> <li>Inadequate performance level or safety category of guarding systems relative to the risks of ejection and entanglement</li> </ul>	4A	[REDACTED]	2M
9. Maintenance, Inspection and Reliability of Machining Plant	<ul style="list-style-type: none"> <li>Reactive, breakdown-only maintenance leading to unexpected failures such as seized spindles, brake failure or chuck failure</li> <li>Lack of scheduled inspections for critical components such as spindles, bearings, braking systems, gears, coolant pumps and electrical controls</li> <li>Inadequate lubrication and asset management causing overheating, fires or accelerated wear</li> <li>Poorly controlled contractor maintenance activities on lathes, mills and grinders without appropriate isolation or supervision</li> <li>Maintenance carried out without lockout-tagout procedures, risk assessments or competence verification</li> </ul>	4A	[REDACTED]	2M
10. Energy Isolation, Lockout-Tagout and Non-Routine Tasks	<ul style="list-style-type: none"> <li>Unexpected start-up of lathes or mills during cleaning, adjustment, tool change or jam removal</li> <li>Failure to isolate all relevant energy sources (electrical, pneumatic, hydraulic, stored mechanical energy) prior to maintenance or fault-finding</li> </ul>	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> <li>• Non-routine tasks such as clearing swarf, changing workholding or setting up jigs conducted without risk assessment</li> <li>• Inconsistent lockout-tagout practices between shifts, contractors and departments</li> <li>• Inadequate signage and communication about machines under isolation leading to unauthorised re-energisation</li> </ul>		[REDACTED]	
11. Exposure to Hazardous Substances, Noise and Ergonomic Stressors	<ul style="list-style-type: none"> <li>• Chronic exposure to metalworking fluids, coolants, lubricants and cleaning agents without adequate controls</li> <li>• Inhalation of fine metal dusts and grinding particulates generated from lathes and grinders</li> <li>• Excessive noise levels from machining operations contributing to noise-induced hearing loss</li> <li>• Manual handling of heavy workpieces, jigs, chucks and finished parts causing musculoskeletal disorders</li> <li>• Repetitive movements and awkward postures at machine controls during detailed machining</li> </ul>	3H	[REDACTED]	2M
12. Fatigue, Work Scheduling and Production Pressures	<ul style="list-style-type: none"> <li>• Extended shifts, overtime and night work in machining operations leading to fatigue-related errors</li> <li>• High production targets encouraging short-cuts such as bypassing guards, rushing setups or skipping pre-use checks</li> <li>• Insufficient rest breaks during intensive machining or repetitive operations</li> <li>• Poor planning of urgent jobs that disrupt established safe workflows and supervision levels</li> <li>• Inadequate supervision during weekends, night shift or remote machining cells</li> </ul>	3H	[REDACTED]	2M

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13. Contractor, Visitor and Labour-Hire Management in Machine Shop	<ul style="list-style-type: none"> <li>Contractors performing machining or maintenance without understanding site-specific plant risks and controls</li> <li>Labour-hire workers allocated to operate lathes and milling machines without adequate competency verification</li> <li>Visitors entering machining areas without awareness of exclusion zones, PPE and emergency arrangements</li> <li>Inconsistent induction content across different contractor companies and host sites</li> <li>No clear allocation of WHS responsibilities between PCBU and labour-hire providers for training and supervision</li> </ul>	3H	[REDACTED]	2M
14. Emergency Preparedness, Incident Response and First Aid	<ul style="list-style-type: none"> <li>Inadequate planning for serious injuries involving entanglement, amputation, eye injuries or ejected components</li> <li>Lack of clear emergency stop protocols and communication methods within noisy machining environment</li> <li>Insufficient first aid resources, training or equipment for common machining injuries (lacerations, amputations, burns, inhalation exposure)</li> <li>Delayed emergency response due to poor site access, unclear signage or lack of information about machinery status</li> <li>Inadequate learning from incidents and near misses leading to repeat events</li> </ul>	3H	[REDACTED]	2M
15. Monitoring, Audit, Consultation and Continuous Improvement	<ul style="list-style-type: none"> <li>Failure to identify deteriorating safety performance or systemic issues in machining operations</li> <li>Insufficient worker involvement in hazard identification and solution development</li> <li>Audit findings not translated into practical, implemented improvements</li> </ul>	3H	[REDACTED]	1L

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	<ul style="list-style-type: none"> <li>• Reliance on lag indicators only (injuries) rather than proactive measures (inspections, near miss data, behavioural observations)</li> <li>• Complacency and normalisation of deviance where minor issues around lathes and mills are ignored</li> </ul>		<div style="background-color: black; height: 15px; width: 100%;"></div> <div style="background-color: black; height: 15px; width: 100%;"></div> <div style="background-color: black; height: 15px; width: 100%;"></div>	

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.