

Appendix 3 – Machine Guarding Presentation

Guarding of Machinery in Manufacturing



Machine Guarding – Risk Management

- Hazard Identification Indicators:
 - Task Observation
 - Inspections / Audits
 - Incident reports / Investigations
 - Safety Meetings
 - Toolbox Talks
 - Managed (systematic) approach
- Does the Systematic Approach include:
 - Use of a specific hazard ID tool
 - Documented risk assessment
 - Review – including after incident
 - Consultation

Machine Guarding – Danger Areas

- Danger Areas**

Typically, the following 2 areas on machinery are dangerous, and can be a risk to anyone near the machine:

- Parts which move or transmit power,
 - Bells and pulleys
 - Flywheels and Gear Wheels
 - Shafts and Spindles
 - Chain and Sprocket Gear
- Parts that do the work:
 - Tools and Dies
 - Blades
 - Cutters
 - Saws
 - Drills and Chucks
 - Rollers.

Machine Guarding - Contents

- OHS Legislation
- OHS Responsibilities –
 - Employers
 - Employees
- OHS Risk Management
- Training / Instruction / Supervision




- Safe Operating Procedures
- Housekeeping
- Plant Maintenance
- Types of Plant
- Emergency Stop Controls
- Isolation
- More Information

Risk Controls / Hierarchy of Control

ELIMINATION OF THE HAZARD SHOULD BE CONSIDERED BEFORE USING THE HIERARCHY OF CONTROLS

- Substitution
- Isolation
- Engineering Controls
- Administrative Controls
- Personal Protective Equipment (PPE)

Machine Guarding - Types

Types of Guards include:

- Fixed Guards
- Fence Guards
- Self Adjusting Guards
- Interlocking Guards:
- Electro-Sensitive Safety Systems:
 - Photoelectric Safety Systems
 - Pressure sensing mats

OHS Legislation


Occupational Health and Safety Act 2000:

- *88 - Duties of employers**
- *10 - Duties of Controllers of work premises, plant or substance**
- *11 - Duties of designers, manufacturers and suppliers of plant and substances for use at work**

Occupational Health and Safety Regulation 2001:

- Chapter 5, Part 5.1, Division 1 - Design of plant
- Chapter 5, Part 5.1, Division 2 - Manufacture of Plant
- Chapter 5, Part 5.4 - Working with Plant


Machine Guarding Doing a Risk Assessment



- Why?:
 - Identify risk
 - Reduce injuries
 - Raise Awareness
- How?:
 - Consultation
 - Step 1: Record the details
 - Step 2: Check the Details
 - Step 3: Inform employees

Machine Guarding – Cross Cut Saw

- Fixed Guards:** Can only be removed using a specifically designed tool




Polycarbonate Guard prevents access to the blade whilst cutting

OHS Responsibilities

Occupational Health and Safety Act 2000:

- *88 - Duties of employers:**
 - Ensure the health, safety and welfare at work of all the employees of the employer.
 - Ensuring that any premises are safe and without risks to health
 - Ensuring that any plant or substance provided for use by the employees at work is safe and without risks to health when properly used
 - Ensure there are systems of work and the working environment of the employees are safe and without risks to health
 - Provide information, instruction, training and supervision as may be necessary to ensure the employees' health and safety at work
 - Providing adequate facilities for the welfare of the employees at work

Machine Guarding - Training




Training

- Ensure all operators receive training in:
 - Safe working procedures
 - Guarding and hazards of the machine they operate
 - Training records shall be kept

Machine Guarding - Beam Saw with Electro Sensitive Safety Systems

Photoelectric Safety Systems

- Detection of an obstruction in the path of the beam
- Taken by a beam or beams of light




- Single beam
- Number of beams of light
- A curtain of light
- Combination of these

OHS Responsibilities

Occupational Health and Safety Act 2000:

- *120 - Duties of Employees:**
 - Must take reasonable care for the health and safety of people who may be affected by the employee's acts or omissions at work.
 - Must, while at work, co-operate with his or her employer or other person so far as is necessary to enable compliance with any requirement under the Act or the regulations that is imposed in the interests of health, safety and welfare on the employer or any other person.

Machine Guarding - Housekeeping



- Ensure sufficient working space
- Ensure persons are unobstructed and able to move safely around a place of work

*Using a Housekeeping Checklist (4925)
*Housekeeping Checklist (4940)


Machine Guarding – Beam Saw



- Flashes Clamp
- Pressure Sensitive mats
- Prime Guard at Rear of Beam Saw




Machine Guarding – Plant Maintenance



- Why?:
 - Identifies trends in breakdowns
 - Competent persons conduct maintenance
 - Isolate Plant
- How?:
 - Record maintenance
 - Staff Awareness

Machine Guarding – Rip / Bench Saw



- RIP SAW WITH NO TOP ADJUSTABLE GUARD AND NO RIVING KNIFE
- RIP SAW WITH TOP ADJUSTABLE GUARD AND RIVING KNIFE

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Machine Guarding – Panel Saw

Dust Extraction System

Riving Knife

Safe Work Procedures

Adjustable Guard

Machine Guarding Planner

Safe Operating Procedures

Bridge Guard - Adjusts over the rotating blade

Machine Guarding Hand Held Power Tools

Retractable Guard

• Ensure hand held power tools are used in accordance with manufacturers instruction

Machine Guarding – Radial Arm Saw

No bottom guarding of Saw Blade either behind or in front of the Safety Fence

Blade extends beyond the table

Self Adjusting Metal Guard restricts access to the Danger area

Machine Guarding – Multi Rip saw

Hold Down Fingers: When used correctly ensures product does not kickback

E-Stop Lanyard

Machine Guarding Electrical Testing and Tagging

- Risk assessment
- Daily Visual checks
- Remove damaged plant

Machine Guarding – Radial Arm Saw

AUTO RETRACT OF SAW

DISTANCE FRONT OF SAW BLADE TRAVELS FORWARD SHOULD STOP AT LEAST 100mm BEFORE THE END OF THE BENCH

Adjustable Guard

FRONT OF SAW BLADE SHIELD RETURNS AT LEAST 50mm BEHIND THE FENCE

Machine Guarding - Routers

Unguarded Spindle Router

Poor Housekeeping

Other Safety Issues

- PPE - Ensure Personal Protective Equipment is used as a **LAST** resort to control a hazard:
 - Check fit, Comfort, Maintenance, Correct use, Training
- FIRE FIGHTING: Access to Equipment, Maintained (6 months)
- DUST: Extractors / Filters regularly cleaned
- SAFE OPERATING PROCEDURES
- MEZZANINE LEVELS: Top Rails, Mid Rails, Toe Boards, Ensure Safe Access to Mezzanine levels
- HAZARDOUS SUBSTANCES: Register, Risk Assessment, Labels, MSDS

Machine Guarding Down Cutting Cross Cut Saw

Unguarded Saw

Self Adjusting Guard

Machine Guarding - Router

Guarding prevents access to rotating spindle

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Machine Guarding – More Information

- For more information on Machine Guarding –
 - Occupational Health and Safety Act 2000
 - Occupational Health and Safety Regulation 2001
 - AS4024.1 – 2006 series - Safety of Machinery
 - WorkCover – NSW – Plant Guide 2001
 - AS1473 series – Wood Processing Machinery
- All Guards must comply with Australian Standards e.g. If a tradesman designs and manufactures a guard in must meet the requirements of the relevant Australian Standard.

Machine Guarding Interlock Fence Guard

Fence Guard prevents access to the Danger area of a Beam saw

Interlock Switch fitted to gate of fence guard.

Machine Guarding Emergency Stop Controls

- Shall be prominent and readily accessible from all operator positions
- Shall be coloured **RED**
- Shall be suitably marked
 - Emergency Stop Buttons shall be "mushroom head" latch-in or lock-in manual reset type
 - lanyards, trip wires or similar devices are acceptable
- Require a **manual reset** before restarting
- Not to be used for normal stopping
- Not to be relied upon for isolation
- NOT an alternative to guarding**

Machine Guarding – More Information

- Also see the WorkCover Guidance Material:
 - Communicating with employees (4917)
 - Tool Box Talk Record (4941)
 - Tool Box Talk Record – Sample (4942)
 - Keeping a record of Hazards and Incidents (4924)
 - Hazard / Incident Report Form (4921)
 - Hazard / Incident Report Form – Sample (4922)
 - Doing a Risk Assessment (4934)
 - Risk Assessment Record (4935)
 - Risk Assessment Record – Sample (4937)
 - Doing a Manual Handling Risk Assessment (4918)
 - Manual Handling Risk Assessment Reference Sheet (4928)

Machine Guarding – Spindle Moulder

Adjustable Guard fitted to horizontal Spindle Moulder

Rear guard covers in access to moving parts

Pinpoint Clamp

Machine Guarding Isolation: Lock-Out/ Tag-Out

An appropriate isolation method is a **lock-out/ tag-out system**, in which one or more padlocks are fitted to the isolation switch, as well as danger tags with the exposed persons' names on them.

LOCK OUT/TAG OUT ISOLATION SYSTEM

Machine Guarding – More Information

- Also see the WorkCover Guidance Material:
 - Keeping Training Records (4926)
 - Training Record (4931)
 - Training Record – Sample (4932)
 - Using a Housekeeping Checklist (4925)
 - Housekeeping Checklist (4940)
 - Making a Safe Operating Procedure (4927)
 - Safe Operating Procedure – Sample Spindle Moulder (4939)
 - Recording Plant Maintenance – (4933)
 - Maintenance Record (4923)
 - Maintenance Record – Sample (4930)
 - Keeping a Hazardous Substances Register (4923)
 - Hazardous Substances Register (4919)
 - Hazardous Substances Register – Sample (4920)