

Safety in your *Focus Area*: HSC Industrial Technology

Answers

Automotive industries

Building and construction industries

Electronics industries

Graphics industries

Metal industries

Multimedia industries

Plastics industries

Timber products and furniture industries

Automotive industries

Activity

Use the information at

<http://www.workcover.com/NR/rdonlyres/99D157B1-69F0-4869-9700-14C5312D2647/0/resInfoSheetMechanic.pdf>

Hazard	Common causes	Ways to minimise the hazard
Manual handling (pushing, pulling, lifting)	• Repetitive lifting, pushing or pulling parts, equipment or tools whilst working on vehicles. • Tools and parts unexpectedly slipping, jarring or moving during the task. • Holding awkward bending or twisting postures whilst working, without sufficient rest breaks. • Continuous holding and working with hand held tools, without sufficient rest breaks.	• Use mechanical aids whenever possible to move, hold or support heavy loads, or get help from someone. • Make sure tools and equipment are in good condition and fit for the job and are well designed, e.g. handles and balance. Use handle extension bars to reduce muscle load. • Stretch and warm up muscles before starting work, or after a break, and make sure you take sufficient rest breaks. • Report and seek early treatment for sprains and strains.
Falls	• Walking and working on slippery (very smooth, wet or oily) floors, stairs or equipment. • Tripping over stairs, tools or equipment on floor.	• Keep your work bay clean and dry. • Clean up oil, fuel or water spills immediately, and

	- Tools or equipment slipping off the job. - Slipping or tripping when getting into awkward postures to work in a vehicle.	store tools and equipment off the floor. - Keep tools and equipment in good condition and fit for the job. Use extension handles to reduce muscle load. - Make sure tools are the right fit and in good condition. - Think about and plan how to get to awkward jobs.
Hitting or being hit by objects	- Parts or tools unexpectedly slipping or falling during work. - Working inside vehicle or under bonnet. - Working around hoists or in pits. - Parts or tools breaking whilst being removed or fitted. - Grit or swarf in eye from job.	- Make sure tools are in good condition and fit properly. - Use proper tool handle extensions for difficult jobs, to reduce muscle load and control the work. - Make sure there is comfortable headroom under hoists and in pits. - Use fitted safety glasses when working under vehicles, when using power tools like grinders and cutters or when in dusty back lots or open areas.

Building and construction industries

Activity

Read the injury case study at:

<http://www.safetyline.wa.gov.au/pagebin/injrsign0119.htm> and answer the following questions.

1. What were the contributing factors to the two workers falling off the beam?
 - Two men standing on the same ceiling joist.
 - Notching the end bearing section of the ceiling joist to fit over the wall plate as indicated in the photos contravenes the Building Code of Australia [clause 3.4.3.] and AS 1684 [1992] the National Timber Framing Code.
2. What were the recommendations of the enquiry into that accident?
 - Ceiling joists are not to be notched in excess of the maximum allowable tolerances outlined in the Building Code of Australia.
 - Carpenters must ensure that when installing a roof frame, the work is carried out in accordance with the National Timber Framing Code AS 1684-1992.

Electronics industries

At the following web site

<<http://www.safetyline.wa.gov.au/PageBin/guidswswa0062.htm>> you will find information to help you answer the following questions about safety while soldering.

Activity

1. What are the health problems that can be caused by repeated exposure to rosin flux while soldering?
Short-term problems can include nose, sinus, eye and throat irritation and skin rashes, and long term problems may include asthma and dermatitis.
2. How can those risks be controlled?
 1. **Elimination:** If possible, eliminate soldering completely, such as by crimping or twisting electrical wire connections, using fastening screws or bolts.
 2. **Substitution:** Fluxes that do not contain rosin are available and may be used as a substitute in some circumstances. Changing to rosin free fluxes may however affect the quality, tolerances, performances and costs. They may also have health effects that are significant. Information should be sought on the possible detrimental health effects of alternatives. All these factors need to be carefully weighed up before any change is made.
 3. **Isolation:** Separate the worker from the fume by physical barriers as in most automated soldering processes.
 4. **Engineering controls:** Where soldering work is done frequently, use local exhaust ventilation to capture fumes at the workpiece, for example, a hood on a flexible arm, tip extraction on the soldering iron itself, or a fume cabinet connected to an exhaust system. Ducts can become blocked with rosin fumes and need to be checked regularly.
 5. **Administrative controls:** Consider rostering or limiting the amount of time a worker spends doing soldering work, or training workers to use any breeze to remove fumes from their breathing zone.
 6. **Personal protective equipment:** Though sometimes essential, this should be only a last resort to prevent exposure. The type of respirator used would depend on the amount of fume present. As a minimum, a combined particulate and organic filter would be required. Suitable gloves and other protective clothing may be needed where there is risk of skin contact, and eye protection if there is risk of splash from liquid flux.

Graphics industries

Activity

Requirements for health and safety in office environments can be found at:
<<http://www.whs.qld.gov.au/guide/gde09.pdf>> from page 12.

1. List examples of risks in the office.
 - Unwanted noise from office machines, traffic, and adjacent workshops that may interfere with concentration causing stress.
 - Awkward manual handling of boxes of computer paper or copy paper.
 - Inadequate or inappropriate lighting and glare, which can lead to sore eyes.
 - Poor ventilation aggravating allergies and asthma.
2. Describe measures for controlling these risks.
 - **Design:** allows risks to be designed out and control measures to be designed in during the planning phase. For example, site the photocopier in a well ventilated area.
 - **Substitution:** replaces the material or process with a less hazardous one. For example, replace the dot matrix printer with a laser or bubble-jet printer to reduce noise.
 - **Re-design:** of equipment or work processes to minimise risk. For example, store heavier loads as close to waist height as possible.
 - **Separation:** isolating the hazard from employees by enclosing it. For example, put a soundproof cover over a dot-matrix printer.
 - **Administration:** modifying work practices so that the time or conditions of risk exposure are reduced, for example, ensuring task variety.
 - **Personal protective equipment:** using appropriate protective clothing or equipment where other controls are not practicable. For example, using gloves when handling toner or ink.

The whole document is an excellent resource for you to study, why not save it so you can read it in more detail.

Metal industries

Activity

Use the information about noise hazards at
<<http://www.whs.qld.gov.au/safetylink/noise/noise03.pdf>> to answer the following questions.

1. List some typical noise sources in the metals industry.
 - hammering on metal objects
 - a punch press
 - angle grinders
 - welding
 - gouging.
2. Describe measures for controlling noise hazards.
 - elimination
 - substitution
 - engineering, e.g. locating noisy equipment such as air compressors and power presses in separate enclosures or by providing a sound proof enclosure for operators. Other engineering control measures could consist of the use of mobile enclosures that could be used at several locations where noisy work has to be carried out.
 - administrative controls, e.g. is the scheduling of noisy work from various fabrication activities into a particular part of the shift, for example early morning or late afternoon, with quieter work activities for the remainder of the work period.
 - personal protective equipment (PPE).

Multimedia industries

Activity

Ergonomics is concerned with designing objects to fit humans for comfortable operation. For example, a desk needs to be the correct height so that a person sitting at it can work comfortably.

Answer the following questions from the brochure titled *Ergonomic workstations for keyboard operators* at: <http://www.whs.qld.gov.au/brochures/bro031.pdf>.

1. What design elements should be considered in a workstation to help eliminate health hazards?

Elements of good design to consider include:

- your chair
- lighting
- noise
- position of the screen
- position of the keyboard
- position of documents.

2. List the features of ergonomically designed chairs.

- back rest, easily adjustable in height and angle
- adjustable back rest depth
- preferably cloth covered seat and back
- curved edge
- height adjustable
- five-star castor base for stability.

3. Describe the best screen position.

The top of the screen should be at approximately eye level and about 60-70cm from your eyes. Your neck should be at rest or relaxed.

Plastics industries

Activity

Working with fibreglass reinforced plastics (FRP) poses many health risks.

Information at:

http://www.eric.sa.gov.au/uploaded_files/g88i.pdf will help you answer the following questions.

1. List the hazards associated with using FRP.
 - Handling glass fibres.
 - Contact with glass fibres can irritate the skin.
 - Using resins and hardeners.
2. Describe the hazards associated with using methyl ethyl ketone peroxide (MEKP).
 - It is highly flammable and rags containing MEKP will self ignite, so spills need to be cleaned up with water and sand.
 - MEKP and promoter combined can explode so should never be mixed or stored together.
3. List the ways you should protect yourself from chemical and fibreglass hazards.
 - Handle substances correctly to minimise spills, skin and eye contact and flammability.
 - Wear personal protective equipment (PPE) e.g. apron or overalls, safety goggles, footwear and ventilator masks, to avoid skin and eye irritation and breathing in fumes and fibres.
 - Ensure adequate ventilation and extraction systems in work areas.
 - Store substances correctly and keep all materials safety data sheets (MSDS) where they can be accessed quickly.
 - Ensure you have been adequately trained in all aspects of safe working procedures and handling of all substances.

Timber products and furniture industries

Activity

Use the document titled *Dealing with risks in cabinet-making* at:
<http://www.whs.qld.gov.au/brochures/bro040.pdf> to complete the following table.

Hazard	Health effect	Ways to control
Noise	- hearing loss - tinnitus	- Reduce noise levels through engineering controls, e.g. machine enclosures. - Keep equipment and machines in top condition through regular maintenance to help reduce noise levels. - Correctly use personal hearing protection. Employers must provide suitable personal hearing protectors.
Dust	- formaldehyde in MDF dust can cause respiratory irritation and cancer - some wood resins in sawdust can cause cancer - sawdust can cause hay fever and asthma	- Check materials safety data sheets (MSDS) for correct procedures for controlling hazards for each type of timber. - Provide adequate dust extraction. - Wear personal protective equipment (PPE) e.g. dust mask.
Two-pack surface finishes	- skin irritation - lung damage e.g. asthma	- Follow MSDS. - Use the hierarchy of control measures, i.e. - eliminate the hazard - substitute another method or substance - isolate the process from other workers - engineering controls - administrative controls - PPE.