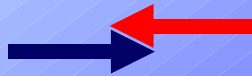


# Safety Pointers

## HAND PROTECTION

29 CFR 1910.138



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### Background for the Trainer

Note that this training session is not intended as a Hand Protection class that would meet all of the OSHA training requirements for your specific facility. Rather, it is intended as refresher training to help reinforce assessing the workplace for hand hazards, selecting appropriate hand protection, the limitations of hand protection, and how hand protection should be worn, inspected, and maintained.

### Speaker's Notes

- OSHA studies have found that nearly one-fourth of work-related injuries involve hands or fingers.
- OSHA also found that 70% of workers sustaining hand injuries were not wearing gloves and the other 30% were wearing improper or damaged gloves.
- We can probably conclude that by wearing gloves that are appropriate for the hazard, we are not likely to suffer a hand or finger injury.
- OSHA requires employers to conduct a hand hazard assessment. Every job is evaluated for potential hand injuries. Once the hazards have been identified, the company can select gloves that will protect against those hazards.
- In this training session we will identify some common hand hazards, select appropriate hand protection, and also discuss how to care for, inspect, and wear the hand protection.

# A Picture Is Worth a Thousand Words

- Working with Chemicals
- Welding & Grinding
- Saws & Knives
- Punctures & Repetition



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## Background for the Trainer

If your workers find any safe or unsafe conditions in the pictures that are not discussed in the Speaker's Notes, please contact Envirowin and inform us of your discovery.

## Speaker's Notes

- These are the titles of the four workplace situations that depict both unsafe and safe conditions. The scenes depicted in this presentation will encourage discussion, which is a critical component of the training session.
- Many of you have probably been in a circumstance that is similar to the conditions portrayed in these workplace situations. Everyone in this class can learn from your experiences. Think about what happened to you, how you responded to the situation, and the lessons that you learned from the experience.
- For each scenario we will view a picture of a workplace situation. Our goal is to find all the safe and unsafe conditions that are depicted. The next slide will point out some of the most important conditions and we will review them. Finally, the third slide of each scenario will depict a corrected picture of the workplace situation.
- At the end of the training session, we will take a short quiz to test your understanding of the material presented.

## What's Wrong or Right?



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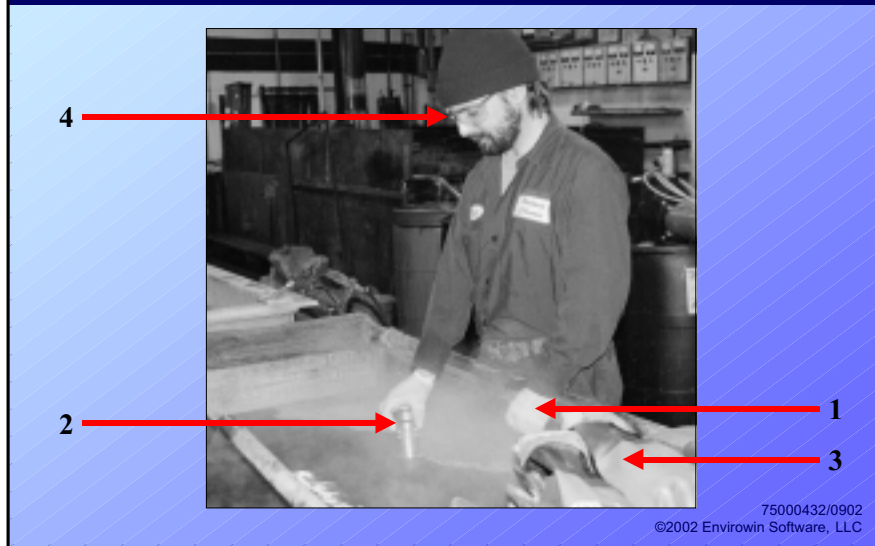
### Background for the Trainer

Encourage employees in the classroom to point out anything in the picture that is either wrong or right. Allow employees to discover as many of the key points as possible by themselves before giving the following hints.

### Speaker's Notes

- In this scene, a worker is dipping a sheet metal part into a tank of heated (about 120°F) solvent in order to clean the oils and greases off the part.
- It looks as though the worker is wearing latex gloves—do you think this is the proper glove material for this work?
- Are the worker's gloves long enough provide adequate protection when manually dipping parts into the tank?
- Do the latex gloves protect against the heat hazard of the solvent tank?
- What about the rest of the worker's personal protective equipment (PPE)? Is it adequate?
- Do you think the sheet metal part might be slippery from the oil, grease, and solvent? Do the worker's gloves have any kind of nonslip grip features?
- Since the parts are probably slippery, the worker has to pinch the parts with a lot of force to avoid dropping the parts. Could this excessive pinching force do any long term damage to the worker's thumb and finger if the worker does this job all day and every day?
- Look at the two pairs of gloves hanging over the side of the tank. What's wrong with these gloves? One pair is severely damaged—what should be done with this pair of gloves? The other pair is wet—what should be done with this pair of gloves?

## Points to Consider



### Speaker's Notes

- Arrow 1: The worker is wearing thin latex gloves for dipping parts into the heated solvent tank. Although latex gloves are appropriate in some solvent applications, such as using a rag of solvent to wipe parts clean, latex gloves do not provide adequate protection for this application.
  - The gloves are not thick enough to adequately protect the worker's hands when they are dipped into the tank of solvent.
  - The gloves are not insulated and will not protect the worker's hands against the heated liquid material. The worker is likely to suffer some mild burns.
  - The gloves are not long enough to protect the worker's wrists and forearms from exposure to the solvent.
- Arrow 2: The worker is required to apply excessive force to pinch the sheet metal part between the thumb and forefinger. The sheet metal parts are slippery from the grease, oil, and solvent and the worker's gloves do not have any type of nonslip grip texture. Over time, this excessive pinching force is an ergonomics risk factor that could result in the worker suffering a musculoskeletal disorder (MSD).
- Arrow 3: Gloves must be inspected before each use and then stored properly after each use. One pair of these gloves must be discarded. This pair has noticeable cuts, abrasions, and even has a duct-tape repair job. These gloves no longer provide any kind of protection. The other pair of gloves appear to be in good shape; they just have not been stored properly. Gloves should be cleaned and hung up so they can dry properly. Also, gloves should be stored in their natural shape—if stored folded the material could crack or otherwise be damaged.
- Arrow 4: The worker is wearing goggles to protect eyes from splashes.

## Corrected Situation



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### Speaker's Notes

- The worker is now wearing thick, insulated, and long rubber/neoprene gloves. The insulation will protect the worker from the heat of the solvent. The thick material will prevent the solvent from penetrating the glove and reaching the worker's hands. The long gloves allow the worker to safely dip parts into the tank without worrying that the solvent will contact his wrist or arm.
- The gloves have a nonslip grip texturing on the palms so that the parts are easier to grip even if coated with oil, grease, and solvent. This texture will reduce the force required by the thumbs and forefingers to hold onto the metal parts; however, it will not eliminate the ergonomic risk factor—the employee could still get a musculoskeletal disorder over time.
- The worker is now dipping the piece of sheet metal with a dip bucket. This allows him to grab the object with his whole hand, avoiding pinching it between his thumb and forefinger. This enables him to stabilize his grip on the object and avoid possible musculoskeletal disorders. Notice the grip the worker is using on the basket. It's a perfect grip. Straight wrist—no ulnar deviation (wrist not bent up or down).
- Engineering controls could be used to eliminate the risk factor. Develop a crane-operated basket system so the employee does not have to physically hold the parts while dipping them into the solvent tank. The worker would just have to operate the crane in order to clean parts.
- The gloves are no longer hanging over the edge of the tank. The pair of gloves that were damaged have been discarded. The other pair that were in good condition and just wet have been cleaned and placed on a glove drying device that not only allows the glove to dry both inside and outside, but the glove is also stored in its natural shape so it is less likely to be deformed or otherwise damaged by improper storage.

## What Have We Learned?

- Know the hazards
- Select appropriate gloves for all hazards
- Inspect gloves
- Store gloves properly



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### Speaker's Notes

- This first scene allowed us to discuss some important points regarding the use of gloves for handling and working with chemicals.
- Before selecting hand protection, the employer needs to know the hazards of the job. In this scenario the hand hazards included exposure to a solvent chemical, a manual dipping operation, and high temperature from the heated solvent.
- Once the hazards are known, the appropriate gloves for the hazard can be selected. In the case of chemicals, it is very important to select gloves that provide adequate protection against the chemical being handled. Most gloves provide great protection from a certain group or type of chemicals, but are either damaged or penetrated quickly by another group of chemicals. Selecting the wrong type of glove material can result in a serious injury. Glove manufacturers have done many studies on chemical penetration, breakthrough, and degradation for their gloves and can recommend the type of glove that is safe for your specific chemical.
- In our scenario, the employer selected a rubber/neoprene glove that gives excellent protection against the solvent the workers are exposed to. The company also had to consider the heat of the solvent as well as the dipping operation. So, the company selected insulated gloves with an elbow length.
- Inspect gloves before each use. Look for cracks, cuts, abrasions, or any other signs of damage. If damaged, discard the glove. Do not attempt to repair a chemical glove.
- Some gloves are disposable and meant to be discarded immediately after use. Gloves that are meant to be used over and over again must be stored properly in between use. Make sure they are clean and dry. Make sure they are stored so that they can maintain their natural shape.

## What's Wrong or Right?



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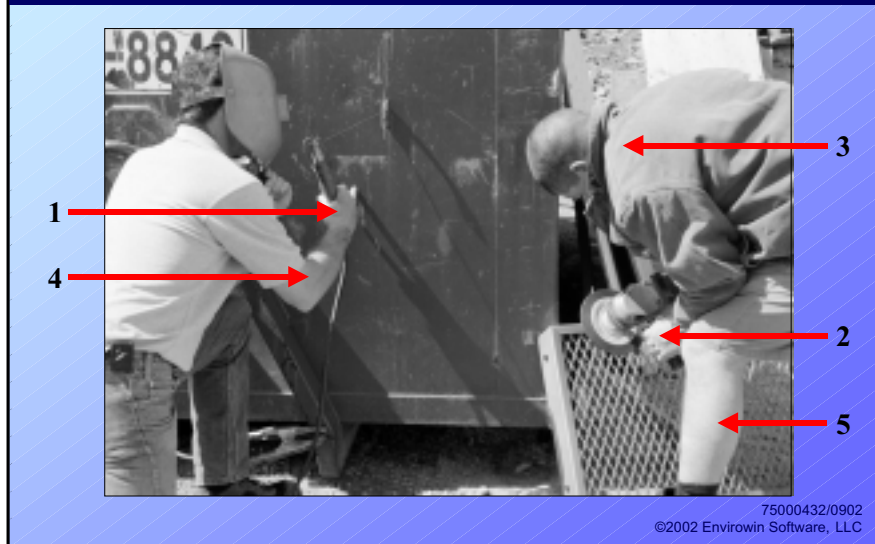
### Background for the Trainer

Encourage employees in the classroom to point out anything in the picture that is either wrong or right. Allow employees to discover as many of the key points as possible by themselves before giving the following hints.

### Speaker's Notes

- In this scene, we have two workers doing some metal fabrication. One worker is about to start welding, while the other worker is using a grinder on some metal parts.
- The welder is not wearing any gloves. What are the hand hazards associated with welding?
- What type of glove should be selected for this welding operation?
- Is the welder wearing appropriate eye and face protection? Is the welder wearing appropriate clothing for a welding operation?
- What type of hand hazards is the grinder operator exposed to?
- Is the grinder operator wearing the right type of glove for this job?
- Do the grinder operator's gloves appear to fit correctly? What could happen if the worker's oversized gloves were snagged or grabbed by the grinding wheel?
- Is the grinder operator exposed to any ergonomic hand hazards?
- Other than hand protection, is the grinder operator wearing appropriate PPE for this job?

## Points to Consider



### Speaker's Notes

- Arrow 1: Welders need to wear gloves in order to protect against hazards such as hot metal, sparks, slag, and even the sharp edges of metal. There are different types of gloves for different types of welding and cutting operations. Select a glove that protects against the temperatures the worker will be exposed to, as well as providing the dexterity that the worker requires. The most common types of welders' gloves are terry cloth or lined leather.
- Arrow 2: The worker that is using the hand-held grinder is exposed to hazards such as sharp metal and hot sparks when grinding. Gloves worn by this worker would protect against those types of hazards. When selecting PPE it is important to make sure that properly fitting PPE is chosen for the job.
- Arrow 3: The grinder exposes workers to an ergonomic risk factor—vibration. This worker could develop a musculoskeletal disorder if required to do grinding work all day and every day over a long period of time. It is important to protect workers against vibration by wearing antivibration gloves. Administrative controls, such as reducing the exposure to vibration through job rotation, can also limit exposure to vibration.
- Arrow 4: The welder should be wearing clothing that will protect his skin from sparks and slag.
- Arrow 5: The grinder's bare legs are exposed to flying sparks and metal pieces.

## Corrected Situation



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### Speaker's Notes

- The welder has put on some gloves that are appropriate for this welding operation.
- The grinder operator has selected gloves that are more appropriate for this job. The gloves have an antivibration feature, fit the worker better, and still protect against the hazards of sharp metal and hot sparks created when grinding.
- Both workers are now more appropriately attired to protect themselves from the hazards they are facing.
- The grinder operator should take a short break in order to stretch his hands, fingers, and wrists. Stretching breaks allow the worker to flex the other muscles in his or her hands that are not used when holding onto the grinder, as well as increase blood circulation to other parts of the hand. Stretching breaks can reduce the impact that vibration has on the hands.

## What Have We Learned?

- Wear gloves whenever handling metal
- Gloves must fit properly
- Be aware of vibration hazards
- Stretch your hands, fingers, and wrists



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### Speaker's Notes

- This second scene allowed us to discuss some important points regarding the use of gloves for welding and handling metal, as well as vibration hazards.
- Wear gloves whenever handling any type of metal. Leather gloves are appropriate protection against metal burrs and most sharp edges. Welding operations also have the additional hazards of hot metal, sparks, and hot metal slag. Terry cloth or lined leather gloves are common gloves to use for welding.
- All gloves, no matter what type or hazard they protect against, must fit properly. Oversized gloves make it difficult to grip objects and can even be grabbed by moving or rotating tools or machines. Gloves that are too small can cut off the blood circulation to your hand, causing numbness and other damage if worn for extended periods of time.
- Be aware of vibration hazards as well as other ergonomic hand hazards. Over extended periods of time, the damage caused by vibration or other ergonomic risk factors can result in severe injuries. Take appropriate steps to protect yourself by wearing anti-vibration gloves or rotating jobs so one employee is not exposed to the hazard all day and every day.
- Take a few moments a few times throughout the work day to stretch out your hands, fingers, and wrists. Use the muscles in your hands that are not used during your work. For example, if your hands are used to grip tightly around a tool, then your stretch would be to straighten your fingers and spread them out—this uses the extensor muscles on the back of your hands.

## What's Wrong or Right?



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### Background for the Trainer

Encourage employees in the classroom to point out anything in the picture that is either wrong or right. Allow employees to discover as many of the key points as possible by themselves before giving the following hints.

### Speaker's Notes

- In this scene, one worker is using a saw to cut some wood and other worker is cutting some plastic tubing with a box knife.
- What types of hazards is the saw operator exposed to? Could the worker be cut by the saw blade or maybe have his hand punctured by a piece of splintered wood?
- Besides using his hands to guide the wood through the blade, what else could the worker do?
- Other than hand protection, is the saw operator wearing appropriate PPE?
- Look at the worker cutting the tubing. What hand hazards is he exposed to? A cut from the knife is possible, but could the worker also use some help gripping the knife or the tubing?
- Could the worker hold the tubing in a different way so that the hand would not be cut if the knife were to slip?

## Points to Consider



### Speaker's Notes

- Arrow 1: One primary hand hazard when using any type of machinery is the point of operation. The point of operation is where the machine does its work—whether cutting, drilling, shearing, shaping, etc. In this scenario, the point of operation is where the saw blade makes contact with the wood to do the cutting.
  - It appears that this saw blade is not properly guarded to protect the user from contacting the blade.
- Arrow 2: This worker is guiding the wood through the blade with his hands, which is exposing the worker to the point of operation. Instead, the worker should be using some type of tool to guide the material through the blade. The worker should also be wearing leather gloves to protect against the hazards presented by handling wood—such as splinters and cuts.
  - The worker could also be wearing metal mesh gloves to protect against the blade. These gloves are not necessarily intended to protect against powered blades; however, they may prevent a worker from being cut. Instead of receiving a cut from the blade, the worker's hand might be bounced away from the blade and not injured at all.
- Arrow 3: This worker is in prime position for a cut. The worker is holding on to a piece of tubing with one hand and a knife in the other hand. The worker is cutting toward the hand that holds the tubing. If the knife were to slip off the tubing, it would likely cut the worker's other hand. If the tubing were used to transfer liquids such as oil, it is very likely that the tubing as well as the knife is very slippery.
  - This worker should be wearing cut-resistant gloves with a grip texture. The texture helps hold the tubing and the knife, while the cut-resistant glove would protect the worker's hand if the blade were to slip.
  - The worker should also be cutting away from his hand and body so that if the knife does slip it will not cut his other hand or body.

## Corrected Situation



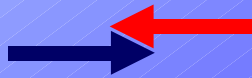
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### Speaker's Notes

- Instead of wearing gloves to protect against cuts from the blade, this worker is using a tool, rather than his hands, to push the wood through the blade.
- The blade guard has been installed onto the saw.
- The worker cutting the tubing is now wearing cut-resistant gloves that are coated with some grip texturing. Not only will these gloves protect against possible cuts, they will also help the worker grip the tubing.
- The worker has also repositioned his hands on the tubing so that he is cutting away from his hand and his body.

## What Have We Learned?

- Keep hands away from the point of operation
- Make sure equipment is properly guarded
- Wear cut-resistant gloves
- Cut away from the body



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### Speaker's Notes

- This third scene allowed us to discuss some important points regarding the hazards associated with saws and hand-held knives.
- Always try to keep your hands away from the machine's point of operation.
- Before using any machinery, make sure all guards are properly installed.
- Wear cut-resistant or metal-mesh gloves when using handheld knives and even when operating saws. Cut-resistant gloves have strips of metal sewn into the material and are often made of materials such as Kevlar.
- Cut away from the body and other hand, just in case the knife slips.

## What's Wrong or Right?



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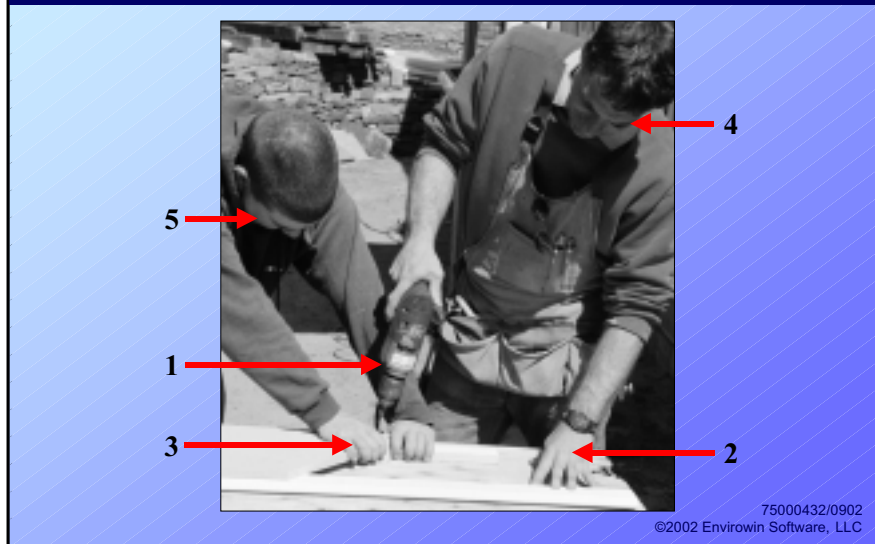
### Background for the Trainer

Encourage employees in the classroom to point out anything in the picture that is either wrong or right. Allow employees to discover as many of the key points as possible by themselves before giving the following hints.

### Speaker's Notes

- In this scene, two workers are building something out of wood. One is using a drill and the other is holding a piece of wood in place.
- What hand hazards does the person holding the wood face? Could the drill slip off the screw and puncture this worker's hand? Could this person also get splinters from handling the wood?
- What hand hazards does the worker with the drill face?
- Does this worker face any ergonomic risk factors if he is required to use the drill all day and every day?
- Could this worker suffer any hand injuries when trying to dig one screw out of a container of screws?

## Points to Consider



### Speaker's Notes

- Arrow 1: The drill presents another type of ergonomic risk factor—repetition—to the drill user. If a worker is required to use a drill all day and every day, the worker is required to press and hold the drill trigger for long periods of time. This repetition, over time, could result in damage to the hand in the form of a musculoskeletal disorder.
- Arrow 2: The driller's hands are exposed to hazards when he reaches into the container of screws to pull out a screw. The driller should be wearing leather gloves to protect against cuts and scratches from the sharp screws.
- Arrow 3: The worker that is holding the wood in place is exposed to a possible puncture from the drill if it were to slip off the screw and be driven into his hand. This worker should move his hands further away from the drill's point of operation.
  - This worker is also exposed to the hazards associated with handling wood, so he should be wearing leather gloves.
- Arrow 4: Notice the driller is not wearing safety goggles. He is exposing his eyes to injury from flying wood dust, wood chips, and possible metal chips from the screws.
- Arrow 5: Notice the helper is not wearing safety goggles either. He is susceptible to the same injuries as the worker using the drill.

## Corrected Situation



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### Speaker's Notes

- The worker operating the drill is now wearing leather gloves to protect his hands from the sharp screws. The worker also takes breaks to stretch his hands out in order to reduce the impact of the repetition.
- The worker holding the wood has moved his hands further away from the drill's point of operation. The worker is also now wearing gloves to protect against the hazards of handling wood.
- Both workers are wearing goggles to protect themselves from flying wood dust and chips.

## What Have We Learned?

- Be aware of puncture hazards
- Repetition can cause long-term damage
- Wear gloves when handling wood



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### Speaker's Notes

- This fourth scene allowed us to discuss some important points regarding puncture hazards as well as the hazards of repetition.
- Punctures from drills, nail guns, hand tools, and even wood or metal slivers can be very painful and even cause severe damage. Be aware of possible puncture hazards, such as a tool slipping, and keep your hands out of the danger zone.
- Repetition can cause long-term damage and result in a musculoskeletal disorder. Jobs with repetition often involve the use of one or more fingers to operate a trigger on some type of tool, such as a drill, paint gun, etc.
- Wear gloves when handling wood, metal, glass, or any other material that could cause cuts or abrasions.
- Wear goggles to protect your eyes.

## Summary

- Learn to recognize potential hazards
- Select the appropriate type of glove
- Inspect, maintain, and care for your gloves
- Be aware of ergonomic risk factors



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### Speaker's Notes

- These are some of the key points that we all should take away from this training.
- Learn to recognize potential hand hazards. OSHA requires a hazard assessment that looks for items including:
  - Skin absorption of hazardous substances
  - Severe cuts or lacerations
  - Severe abrasions
  - Punctures
  - Chemical burns
  - Thermal burns
- Select the appropriate glove for the hazard. Chemical gloves come in many different types and styles and only protect against certain chemicals, so be sure to pick the right glove for your chemical. Use cut-resistant gloves if exposed to cut hazards. Wear leather gloves to protect against abrasions or minor cuts. Use antivibration gloves when exposed to vibration hazards.
- Make sure the selected gloves fit properly.
- Inspect gloves before each use. If damaged so that they do not provide the necessary protection, discard and replace them. Keep your gloves clean, dry, and stored properly.
- Be aware of ergonomic risk factors, which include vibration, excessive pinching or gripping force, and repetition.
- Always protect your eyes.

# Quiz

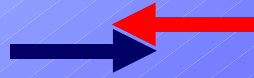
1. Name one of the ergonomic hand hazards that workers might face:
2. A glove for use with chemicals will protect against all chemicals. **True or False**
3. What type of gloves do welders commonly wear?
4. When inspecting your gloves, name one thing to look for:
5. What kind of glove should a person wear when cutting up frozen fish with a handheld knife?



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## Quiz (cont.)

6. What is the most hazardous area on a typical machine?
7. What type of glove is used to improve a worker's grip?
8. Describe how you should care for and store your gloves:
9. When are gloves hazardous to wear?
10. In addition to gloves, describe other things used to protect hands:



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## Quiz Answers

1. Vibration, pinch or grip force, repetition.
2. False; select a glove material that has been tested to protect against your chemicals.
3. Terry cloth or lined leather gloves.
4. Inspect for cuts, tears, abrasions, or any other damage that reduces the glove's protection.
5. Metal mesh gloves to protect against the cut hazard, with thick cotton gloves to protect against the cold of handling the frozen fish.



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## Quiz Answers (cont.)

6. Point of operation—cut, drill, form, press, shear.
7. A glove with nonslip texture.
8. Gloves should be kept clean and dry, and stored so they maintain their natural shape.
9. Around rotation equipment that might grab the glove and pull your hand into a machine.
10. Machine guards, engineering controls, administrative controls.



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