

# Knife Safety

## Meeting Objectives

To make sure employees fully understand the hazards of knife use both at work and at home as well as how to safely use, sharpen, and maintain knives.

## Suggested Materials to Have on Hand

- Examples of the different types of knives used in your workplace
- Examples of knife storage equipment, such as blocks, pouches, and sheaths- whatever is used in your facility
- Grinding wheels, stones, or steels used for sharpening in your workplace
- Examples of different types of cut-resistant gloves available in your workplace
- Written safe work practices for using knives in your workplace

## Introduction/Overview

Knives are important tools that are used in many workplaces as well as for recreation or at home. Knives come in many different forms and each type of knife presents different hazards, although the primary hazard is the sharp blade that can cause deep and severe lacerations. It is important that employees take these hazards seriously and follow safe work practices, including how to safely use, handle, carry, store, sharpen, clean, and maintain the knives they use in the workplace or at home.

## OSHA Regulations

The Occupational Safety and Health Administration does not have specific rules or regulations regarding the use of handheld knives in the workplace. However, OSHA's General Duty Clause requires employers to provide a workplace and work practices that are free of recognized hazards. The use of handheld knives in the workplace is an obvious hazard, so it is important that employees be aware of the hazards as well as safe work practices specific to your company.

## Knives-Invaluable Tools

Knives, of any shape or form, are important tools in many industries as well as at home. This meeting will focus on the use of knives in food preparation and their use in warehouses and shipping/receiving departments. There are many other areas where knives are used as well, including:

1. Carving wood or other materials
2. Cutting rope or twine
3. Cutting fabric, carpet, drywall, etc.
4. Fishing and hunting

*Discuss why knives are used in your workplace as well as why you use knives at home.*

## **Types of Knives**

Knives come in hundreds of different varieties, such as:

- Pocketknife
- Single-blade knife
- Utility knife
- Razor blade scraper
- Snap-off blade knife
- Hunting knife
- Machete
- Vegetable knife
- Meat-cutting knife
- Bread knife
- Shellfish knife

Bring examples of the different types of knives that are used in your workplace.

## **Selecting the Correct Knife**

Knives come in many different shapes and forms, each one designed for a specific purpose or job. Selecting the correct knife for the job is very important to ensure that the job can be completed correctly and safely.

When selecting a knife, consideration should be given to the following:

Knife blade: What is the appropriate knife blade for the job required?

- Are you cutting fish, shellfish, beef, wood, cardboard, bread, etc.?
- Should the blade be firm or flexible?
- Should the blade be retractable?

Retractable blades are frequently used in workshops and shipping departments

because they can be safely left on a workbench when the blade is retracted.

Knife edge: What type of edge is best for your purpose?

- Fine edged blades produce a smooth, clean cut.
- Serrated blades are good for cutting food products with a skin or crust and a soft interior.
- Serrated blades are also used for cutting cardboard cartons and similar packing materials.

Handle size: Is the handle large enough to provide a secure grip?

- This prevents the hand from slipping forward over the blade and reduces the force required to hold the knife.

Handle design: Is the handle designed to reduce excessive wrist bending?

- The principle is to use the tool, not the wrist.

Handle material: What is the handle made of?

- Handles used in the food industry should be made of non-absorbent materials that are resistant to fat and oils to prevent them from becoming slippery and unhygienic. Wood handles should not be used in the food industry.

Handle grip: How is the grip formed?

- When holding the knife, the grip should be spread so that it is even along the handle.

Comfort: Does the knife feel comfortable?

- If not, musculoskeletal injuries may develop if the knife is used frequently.

Parts of a Knife

All knives have similar parts:

- Point-the very tip of the blade
- Back edge of blade-the unsharpened, or dull, edge of the blade steel
- Cutting edge-the sharpened edge of the blade steel
- Bevel-forms the cutting edge when the edge of the blade steel is ground down at an angle on both sides to come to a sharp point. The size of the bevel should be the same on both sides of the cutting edge in order to have a straight cut.
- Shoulder-where the bevel angle meets the straight, ungrounded, blade steel
  - Heel-the part (often not sharpened) of the cutting edge closest to the handle

- Bolster-a collar or shank on some knives, at the point where the blade meets the handle
- Tang-a continuation of the blade that extends into the knife's handle

Knives used for heavy work, such as chef's knives or cleavers, should have a full tang, that is, a tang as long as the entire handle.

- Handle-the part of the knife that the user holds
- Safety stop- the part of the handle closest to the blade that prevents the user's hand from slipping forward onto the blade
- Grip-area of the handle that the user's fingers wrap around so the user can comfortably hold and use the knife without it slipping
- Butt-the end of the handle that prevents the user's hand from slipping off the back end of the knife handle

*Point out these different parts on one of the knives commonly used in your workplace.*

## **Hazards of a Knife**

The type of knife used and how it is handled, sharpened, and maintained are very important in achieving the desired results. All of these factors are also essential for worker safety and preventing injuries. The type of injuries that occur from the unsafe use of knives range from small nicks to serious disabling cuts.

Other injuries related to the repeated and long-term use of knives can include wrist strains and sprains.

### **Dull Knife**

A dull knife is dangerous; it will slide when you want it to cut, and then, when it stops sliding, it will cut, usually somewhere you didn't want it to cut, like your hand. Dull knives also cause people to put more effort into cutting, which encourages unsafe and awkward cutting positions. To avoid such accidents, it's a good idea to learn how to sharpen your knife properly or know when to take it to an expert for sharpening.

## **Using Knives Safely**

The basics of safely using a knife include:

- Making sure the area around you is clear-creating a knife safety circle
- Grasping the knife handle with your whole hand
- Cutting away from your body

### **Knife Safety Circle**

To establish a knife safety circle:

- Pretend you have a knife in your hand.
- Extend your arm with the pretend knife straight in front of you.
- Rotate your body to either side while continuing to extend the arm with the pretend knife.
- Also check your overhead clearance, as this is also part of your safety circle.

No person or thing should be in the imaginary circle you have created.

## **Proper Grip**

Hold the knife firmly by the handle. Wrap your fingers completely around the handle so you have a firm grip. Never press on the back edge of the blade when cutting.

If the knife slips out of your hand-**do not attempt to catch it!** Get out of the way and let it fall.

## **Cutting Direction**

Always cut in a motion away from your body and away from other people. This way, if the knife slips, it will not cut your body or the body of a person standing near you.

Keep your other hand, fingers, and thumbs out of the way of the cutting line. If you have to grip the object you are cutting, then cut away from your hand. **Never cut toward your hand or your body!**

Stay focused on the cutting job. Do not allow your mind to wander and do not talk with co-workers while using a knife. When interrupted, stop cutting and place the knife down on a secure surface. **Do not try to cut while distracted!**

When you have finished using a knife, clean it, put it away immediately, and store it properly.

## **Handling Knives**

### **Pass an Open Knife Safely**

The person holding the knife should hold the knife by the blade, cutting edge away from the hand, and pass the handle to the other person. In this way the handler has control of the edge of the knife and the person receiving the knife is reaching for the handle rather than a sharp blade.

Instead of passing the knife directly to a person, consider placing the knife onto a clean surface and allowing the other person to pick it up.

### **Carrying Knives**

When possible, carry a knife in the closed position or safely protected in a sheath or

knife pouch. However, there may be occasions when you need to carry an unprotected knife. If so, carry one knife at a time, with the blade pointed down and close to your side.

## **Storing Knives**

Do not store knives with the cutting edge of the blade exposed.

Knives should never be left in a position that may cause harm to someone, and they should never be left loose in a drawer or locker. Do not leave a knife near the edge of a table or counter or sticking over the edge of a counter.

*Discuss how knives should be stored in your workplace.*

## **Maintaining and Caring for Knives**

Knives are valuable tools, so you need to know how to take care of them.

- Knives should be kept clean, dry, and sharp at all times.
- Never use your knife on things that will dull or break it.
- Keep your knife off the ground. Moisture and dirt will ruin it.
- Keep your knife out of fire. The heat draws the temper of the steel and the edge of the blade becomes soft and useless.
- Wipe the blade clean after using it. Then close or store the knife carefully.

## **Use of Knives in Food Preparation**

### **Clean and Hygienic Use of Knives**

When not in use, knives used in food preparation should be stored in a secure and hygienic manner. For example, store them in a pouch that has been cleaned and sanitized, on a rack on the wall, in a clean knife sheath, or in a block designed for the storage of knives.

Knives should be cleaned and sanitized before starting work, after breaks, and after coming into contact with contaminated materials or surfaces, such as the floor or a cutting board that has not been washed since it was used to cut another substance. This is important to prevent cross-contamination of the different food products.

Procedures used for cleaning the knife will usually depend on your company's cleaning and sanitation program. However, both the blade and handle should generally be scrubbed at least daily, with a scrubbing brush or nylon scouring pad and detergent solution. The knife should then be rinsed and sanitized. The easiest way to sanitize knives is by using a sanitizing chemical.

Knives may be stored in a chemical sanitizer overnight and then rinsed before use. Care should be taken to use chemicals that are not excessively corrosive to either the blade or the handle.

Never put the knives in a tub of soapy water. If you can't see the blade, you can't protect yourself from being cut.

### **Chopping Vegetables-using a fine-edged knife**

When chopping vegetables, cut a bit off the underside of the vegetable to create a flat base that stabilizes the vegetable. Curl the fingers of the hand that is holding the vegetable and cut, using the tip of the knife as a pivot. When using a cutting board, placing a damp towel under the cutting board will prevent it from slipping.

A small fine-edged knife should also be used for peeling fruits and vegetables. It will produce a smooth, clean cut without destroying the texture.

### **Cutting food with a crust or skin-using a serrated or scalloped-edge knife.**

These knives are best for cutting and slicing soft products with a hard skin, e.g., tomatoes. They are also good for cutting bread because they penetrate the hard crust but slice the soft interior without crushing it.

A similar type of knife with a hollow ground edge is specially shaped for cutting delicate products.

## **Sharpening Knives**

A dull knife won't do its work. And what's more, it is dangerous. More fingers are cut by dull knives than by sharp knives. A sharp knife bites into the object being cut, while a dull knife tends to slip off the object.

A sharp knife will move freely through the material being cut. A knife that needs sharpening will not do the job it is required to do. It will "drag" through the material rather than cut cleanly. More force or pressure will also be required from the person using the knife.

### **When to Sharpen Your Knife**

To test whether a knife is sharp, run the knife very lightly over the edge of a plastic or nylon block. If the knife slides through, it requires sharpening. If the knife appears to "grab" or "bite" into the block, then it is sharp.

### **How to Sharpen Your Knife**

In simple terms, sharpening a knife means removing enough blade metal along the cutting edge so that it becomes sharp enough to cut the desired material. Removing the metal is not too difficult, but removing the right amount and maintaining the same angle throughout the length of the blade can be.

There are a number of ways in which the blade metal can be removed, for example, by using a grindstone, a stone, or steel. The grindstone is the coarsest of the three and removes the greatest amount of metal. The steel is the smoothest and removes the least amount of metal.

## Grinding

The process of grinding a knife, which is often used to prepare a new knife, requires care and attention. Grinding a knife is a quick way of resetting the shoulder or clearing away damaged areas of the blade. However, there are some problems with grinding knives.

For example:

- Things happen fast on a grindstone. A single distraction can result in a badly shaped knife or a nasty injury.
- It is easy to overheat the knife and ruin the temper of the blade.

Before choosing to grind a knife consider the following:

- Can the knife be sharpened on a stone instead of the grinder? There are varieties of coarse stones available that will do the same job as grinding, often with greater precision, nearly as fast, and with far less risk.
- Has the correct training been given for using a grinder-particularly, how to hold the knife, what angle to use, and the safety precautions to take?

If grinding is required, practice holding the knife at the appropriate angle before turning the grinder on.

- Ensure that the possibility of distraction, such as an interruption or unexpected noise, is minimized while grinding.
- Use plenty of water when grinding. This will prevent the blade from burning and also eliminate damage to the knife and grindstone.
- Know the direction that the wheel turns and how the knife is applied. Always be sure that the cutting edge of the knife is facing away from your body and that the wheel is rotating away from you. Never put a knife onto a wheel rotating toward you unless the wheel has a safety guard. Follow the manufacturer's instructions at all times.

## Steps for Grinding

1. Turn on the grinding wheel.
2. Hold the handle firmly with one hand and place the knife on the grindstone, with fingers of the other hand on the back edge of the blade to steady the knife.
3. Keep the knife as flat as possible on the grindstone and commence grinding at the heel of the blade.
4. Slowly move the knife in an arc across the grinding wheel, moving along the cutting edge and finishing at the nose or tip of the knife.
5. Repeat the same process on the opposite side of the knife.

6. Repeat steps 3, 4, and 5 until the desired shape is obtained.

## **Stones**

A variety of stones are available to sharpen knives. The most common is the water stone made of silicone carbide. Preferably, stones should be stored lubricated and kept from drying out. They may need to be soaked before use, especially if they are dry. It is important to add the appropriate lubricant, such as water, during stoning.

A coarse stone can be used to form the "initial set" of the bevel and shoulder when preparing a new knife or resetting the shoulder of a damaged or worn knife. This sets an even beveled surface along both sides of the blade at a constant angle. The bevels should meet precisely along the full length of the blade edge.

A smooth stone is used to form the "finished set." This is critical, and care is needed to ensure that the angle of the bevel is maintained evenly along the blade. A well-polished edge will always last longer and perform better than a coarse, rough edge.

## **To Stone a Knife**

When stoning a knife, always move it in one direction. Running the blade forwards and backwards or round and round on a stone should be avoided.

Always ensure that the stone is secure before use. It should be anchored in a properly mounted stone holder to prevent it from slipping. It should also be positioned at a comfortable height so the operator can move around it to suit the side of the blade that is being sharpened.

The wearing of hollows in the center of the stone must be avoided. The full flat plane should be maintained because irregularities in the stone become reflected in the shape of the knife. The flat plane can be maintained by sharpening the knife over the full length of the stone.

Check to ensure that the stone is flat, not hollowed in the center, and free of cracks and chips.

## **Steps for Stoning**

1. Clean the knife and add the required lubricant, such as water, to the stone.
2. Place the tip of the blade on the end of the stone with the blade at an angle of approximately 10°. Hold the knife with all four fingers around the handle, with the thumb at the back and slightly on the top side. The other hand can be placed on top of this hand for extra support, especially if the blade is flexible.
3. Move the knife backward in an arc across the stone with average-to-firm pressure. Use as much of the stone as you safely can, making as many strokes as necessary. Always stroke the knife from tip to heel and from corner to corner on the stone. Turn the knife over and repeat the process on the opposite side.
4. To finish the knife so that it is ready for cutting, turn the blade slightly toward

the cutting edge and make single light strokes on the alternate sides of the knife.

Sharpening the knife on the stone makes the cutting edge very thin; consequently, it will turn or roll over very quickly and form a lip. This lip or rolled edge needs to be removed to retain the cutting edge. Otherwise, the knife will not cut cleanly. A steel is used to do this.

## **Steeling**

A steel is used to remove the lip or rolled edge and to return the knife to its desired sharpness. Steeling will help maintain the edge and keep it straight. A steel does not create the cutting edge; this can only be completed by using a stone.

A variety of steels are available and a quality steel gives the best quality finish. The smoother the steel, the finer the cutting edge. Lower grade, cheaper steels are more likely to rust.

Steels should always be clean and free of rust. Steels should also have guards fitted between the steel and the handle to keep the knife blade from striking whatever hand is holding the handle of the steel.

## **Steps in Steeling**

1. Clean the knife before you start.
2. Hold the knife by the handle in whichever hand you use most. Tuck your thumb around the opposite side of the handle, with your little finger positioned underneath the handle. This will help you hold the knife at the correct angle against the steel.
3. Hold the steel in the other hand making sure your thumb is under the guard at the base of the steel to prevent you from cutting yourself. The steel should be at an angle of about 70 degrees from the body.
4. Place the heel of the knife on the top of the steel and turn it slightly, about 10 degrees, toward the cutting edge.
5. With light pressure using a downward stroke, move the knife firmly from the heel of the blade through the cutting edge. Finish the stroke at the point of the blade.
6. Repeat this process on the other side of the blade.
7. Repeat this process on both sides of the blade several times to adequately steel the knife.
8. Avoid a chopping action or bashing the knife on the steel.

Remember, a few slow but precise strokes are better than many fast strokes. Steeling may take place many times during the working day. It is important that it is carried out efficiently and safely every time.

## **Alternative Sharpening Devices**

There are alternative sharpening devices available to replace the traditional tone and steel. In addition, some knife supply companies offer knives that have been pre-set to the angle required and sharpening services for knife maintenance. Contact a supply company for more details.

## **Knife Replacement**

Knives should be replaced when they can no longer be effectively or safely sharpened or they are no longer suitable for the job.

## **Use of utility knives with packing materials**

### **Choosing the right knife for the job**

- No single utility knife is right for every job.
- Too large a blade is unwieldy.
- Too small a blade makes the job more difficult than necessary.
- Different blade types are designed for different functions.

### **Knife features to choose from**

- Utility knife blades are either fixed or retractable.
- Fixed blades can't collapse but can be hazardous to carry around.
- Most retractable knives today are reliable and not prone to collapse.
- Serrated edges are better for cutting cardboard, boxes, and rope.
- Straight blades are better for cutting clean edges.
- Other features to look for are blade guards and secure grip handles.

### **Safe care and storage of utility knives**

- Keep blades sharp-they are safer and require less force to use.
- Blades should be sharpened or replaced as often as necessary.
- All blades, except stainless, need occasional oiling.
- Keep knives sheathed-cardboard is often recommended.
- Never leave knives lying loose-store them in a drawer or toolbox.

### **Using utility knives safely**

- Plan your task before you begin.

- Work in a well-lighted area.
- Select a sharp knife with a good grip and a blade guard.
- Always cut away from your body.
- Always cut on a cutting board or sturdy surface.

## **Personal Protective Equipment**

Follow the Personal Protective Equipment (PPE) Standard of 29 CFR 1910.132. Assess the tasks to identify potential work hazards, including lacerations. Provide appropriate PPE to protect workers. Ensure workers use PPE where required.

Require employees to use appropriate hand protection when hands are exposed to hazards like cuts and lacerations. For example, use steel mesh or Kevlar gloves when cutting.

### Common cut-resistant gloves include:

- Metal mesh gloves made of stainless steel rings
- Steel core gloves, which are fabric with steel woven into the material
- Kevlar gloves made of strands of Kevlar material
- Rubber-coated fabrics

Your choice will depend primarily on the level of cut-resistance needed. A person using a box knife will not need the same protection as someone cutting fish with a large, sharp blade.

### **Other glove considerations**

- Consider the length and cuff requirements. If the worker requires wrist or forearm protection, longer gloves are necessary.
- Dexterity and grip. Meat cutters will need to be able to grip slippery materials and have the dexterity to handle a knife.
- Thermal protection may be required when handling hot or cold steel parts.
- Size, comfort, and price are obviously important because the employees may not wear the gloves if they are uncomfortable. Employers should have multiple sizes and styles available. Price is always important; however, cheaper is not always better because the cheaper gloves will wear out much sooner than more-expensive and higher-quality gloves.

### **Protective Clothing**

You may also need to wear protective clothing, such as aprons or shirts made of cut-resistant materials such as Kevlar or steel mesh.

*Bring samples of the types of cut-resistant gloves that are required or recommended for use in your workplace.*

## **Suggested Discussion Questions**

1. Name the tasks in your workplace that require the use of knives.
2. What are the different types of knives used in your workplace?
3. What different types of knives do you use at home?
4. What should you consider when selecting the correct knife for a certain task?
5. Discuss why a dull knife is hazardous.
6. Describe the safe way to cut with a knife.
7. Describe some ways to safely pass a knife to someone.
8. Discuss the different ways to sharpen a knife blade.
9. Discuss the types of hand protection available in your workplace for knife users.
10. Are there any other questions?

## **Wrap-Up**

Knives are valuable tools that are used by many workers as well as many people for recreation or at home. Although knives can cause serious injury, they can also be used safely. Remember to cut away from your body, carry and pass knives safely, keep knives clean and sharp, store knives properly, and wear cut-resistant gloves when using a knife.

## **Sample Handout # 1**

### **Selecting the Correct Knife**

Knives come in many different shapes and forms, each one designed for a specific purpose or job. When selecting a knife, consider:

- Knife blade
- Handle size
- Handle design
- Handle material
- Handle grip
- Comfort

### **Parts of a Knife**

- Point
- Back edge of blade

- Cutting edge
- Bevel
- Shoulder
- Heel
- Bolster
- Tang
- Handle
- Safety stop
- Grip
- Butt

## Sample Handout # 2

### Using Knives Safely

#### Cutting Safely

- Make sure the area around you is clear-create a knife safety circle.
- Grasp the knife handle with your whole hand.
- Cut away from your body and your other hand.
- Stay focused when cutting-do not try to cut while distracted.
- Step away from a falling knife-never try to catch it.

#### Passing an Open Knife

- Hold the knife by the back edge of the blade and offer the handle to the other person.
- Set knife down and allow the other person to pick up the knife.

#### Carrying Knives

- Close a folding or retractable knife.
- Keep the knife in a sheath or knife pouch.
- Hold an unguarded knife with blade pointed down and close to your side.

#### Storing Knives

- Knife pouch
- Knife rack
- Knife sheath
- Knife block

#### Maintaining and Caring for Knives

- Do not leave knives loose in a drawer or on a counter.
- Keep knives clean, dry, and sharp.
- Never use your knife on objects that will dull or break it.
- Keep your knife off the ground. Moisture and dirt will ruin it.
- Keep your knife out of fire.

- Wipe the blade clean after using it.
- Store it carefully.

### Sample Handout # 3

## Personal Protective Equipment

### Personal Protective Equipment (PPE) Standard of 29 CFR 1910.132

1. Assess the tasks to identify potential work hazards.
2. Provide personal protective equipment.
3. Ensure workers wear the personal protective equipment.

#### Common cut-resistant gloves include:

- Metal mesh gloves
- Steel core gloves
- Kevlar gloves
- Rubber-coated fabrics

#### Other glove considerations

- Length and cuff requirements
- Dexterity and grip
- Thermal protection
- Size, comfort, and price

#### Protective Clothing

Aprons or shirts made of Kevlar or steel mesh

### Knife Sharpening Checklist

**A dull knife won't do its work and is dangerous. More fingers are cut by dull knives than by sharp knives.**

#### Grinding Your Knife

Grinding a knife is a quick way of resetting the shoulder or clearing away damaged areas of the blade. However, grinding can also damage the knife or cause injury to the person using the grinder.

1. Turn the grinding wheel on.
2. Hold the handle firmly on the grindstone.

3. Keep the knife as flat as possible on the grindstone.
4. Slowly move the knife in an arc across the grinding wheel.
5. Repeat the same process on the opposite side of the knife.
6. Repeat steps 3, 4, and 5 until the desired shape is obtained.

### **Stoning Your Knife**

A coarse stone can be used to form the "initial set" of the bevel and shoulder. A smooth stone is used to form the "finished set."

1. Clean the knife and lubricate the stone with water.
2. Place the tip of the blade on the end of the stone.
3. Move the knife backward in an arc across the stone. Always stroke the knife from tip to heel and from corner to corner on the stone.
4. Turn the knife over and repeat the process on the opposite side.

### **Steeling**

Steeling will help maintain the edge and keep it straight.

1. Clean the knife before you start.
2. Hold the knife in your natural hand by the handle.
3. Hold the steel in the other hand.
4. Place the heel of the knife on the top of the steel and turn it slightly, about 10 degrees, toward the cutting edge.
5. Using a downward stroke, move the knife firmly from the heel of the blade through the cutting edge. Finish the stroke at the point of the blade.
6. Repeat this process on the other side of the blade.
7. Repeat steps 4, 5, and 6 on both sides of the blade several times to adequately steel the knife.