# Welding Safety



#### Objectives

Identify hazards in the shop

Learn about protective clothing

Understand the dangers of fire, electricity, fumes, cylinders, and machines

Explain how to avoid potential hazards in the shop

### Dangers in the shop

- Your personal mind set
- Physical factors
- Heat, sparks, hot metal, flammable materials
- Electricity
- Machines and moving vehicles
- Compressed gases
- Loud noises
- **Fumes**



## Personal factors

things you can change

- Having a bad attitude
- Stressed out
- Feeling sick or tired
- Drug usage
- Lack of job knowledge
- Lack of wisdom and age (fooling around or acting immature)

#### Physical factors things you don't have control over

- Equipment failure
- Time of day
- Tidying (cleaning up so that you and the people around you are less likely to slip, trip, and be burnt.)



#### Protective clothing

In the shop, there will be other people working around you. That is why before you enter the shop make sure you are properly dressed.

- This includes:
- 1. <u>Safety glasses</u> (protect eyes from hot metal, sparks, equipment failures)
- 2. Leather boots (protect feet from hot metal, and falling objects)
- 3. Jeans with NO cuffs or frayed parts that go OVER your boots (protect legs and ankles)
- 4. <u>Cotton shirt</u> (protects the top half of you)

#### DO NOT COME UNPREPARED, you will not be allowed to enter the shop





#### The Well-Dressed (Safe) Welder



#### What is welding?

Welding is joining two or more metals together permanently.

The three types of welding you will be introduced to are SMAW (shielded metal arc welding, or stick), GMAW (gas metal arc welding, or MIG), and GTAW (gas tungsten arc welding, or TIG).







► SMAW

GMAW

GTAW

- These three processes use an electric arc to create heat that melts the metal into the base metal.
- The electric arc is very bright, and the <u>ultra violet light</u> can hurt your eyes and skin.
- If you look at the arc without protective safety gear, you can get <u>arc flash</u>. Arc flash is a sunburn on your eyes. There is no remedy if this happens other than putting a cool, damp cloth on your eyelids and resting until it feels better.



#### Preventing arc flash

- ► Wear a welding helmet. The dark lens protect your eye.
- Helmet has a number system, which rate the shade from light to dark in (low to high) number.
- Before you strike the arc and start welding, make sure you are correctly wearing the helmet and anyone around you is aware.





- Welding generates a lot of heat and sparks. The <u>ultraviolet</u> and <u>infrared</u> rays can also affect your skin, as the sunray does. This is why a welding jacket and gloves are required. Caps for your hair are also available.
- Wear leather gloves, and jackets made from leather, cotton, rayon, or denim. These items are flame retardant, not resistant.
- When dealing with hot metal, <u>use a tool</u> to move it, not your clothing.





#### Fires

- A <u>fire watch</u> is a person whose job it is to keep workers safe when dealing with fire. Their responsibilities include using a fire extinguisher, notifying workers, the alarm system, directing through escape routes, and shutting down equipment.
- <u>Class A Extinguisher</u> Ordinary combustibles (like wood or paper.)
- <u>Class B</u> Flammable liquids
- <u>Class C</u> Electrical equipment
- <u>Class D</u> Combustible metals
- To prevent fires, keep the area around you clean, and keep anything flammable away from your work area.
- Any <u>flammable chemicals</u> need to be stored in an <u>approved steel</u> <u>cabinet</u>.



### Electricity

- In this program, you will be working around a lot of electricity. Here are some things to remember:
- All electricity can be dangerous.
- Always inspect cables for exposed wires.
- NEVER work in a wet glove or on a wet floor.
- > 220 volts must be well marked.
- NEVER try to fix something when the machine is on. Only qualified person should do the electrical repairs.







#### Machines

- Be fully trained before using a machine.
- That includes where to keep your hands and feet, proper clothing, and work procedures.
- Even hand grinders are dangerous. Before using, check that there are no loose parts, and no exposed wires.
- Robotic equipment is usually very heavy and quick moving. It runs by a program, and will not stop if you get in the way.





#### Ventilation

- Be aware of the ventilation system when welding. The idea is to have the suction above the metal you are welding so the fumes exhaust into the vent and away from you.
- ▶ High ceilings are ideal in welding shops; they provide greater air volume.



#### Lifting heavy items

Always keep your <u>back straight</u>.

Lift with your legs.

Some companies require wearing a back brace.



#### High Pressure Cylinders

- Always stored in the <u>upright position</u>, and <u>fastened</u> to a post or wall using chains or steel bands.
- Store and move with <u>safety caps</u> in place.
- Move using a <u>cart or tip on its side</u> and roll them.
- Acetylene gas NEVER used over 15psi.
- Bleed or empty the system of all gas when done.
- Release all pressure by turning the adjusting screw out.



#### Hazards to hearing

Plasma arc welding and cutting, arc gouging and explosion processes produce sound levels that can cause hearing damage.

Earplugs are available by the doorway when you enter the shop.

