SECTION 4 CHAPTER 17
PERFORMING WELDING/CUTTING OPERATIONS

Purpose

This chapter describes the safety procedures for welding/cutting operations.

Scope

This policy applies to all company employees involved in welding/cutting operations.

In this chapter

Ensuring Personal Safety

Purpose

This document outlines the safety requirements for ensuring personal safety, including training and personal protective equipment.

Policy

Do **not** point the torch at other personnel. Keep the torch away from combustible and/or flammable materials.

Required training

Only personnel who are trained and authorized by the company will operate an arc welder or cutting torch.

All personnel who will be required to maintain and/or operate welding/cutting equipment or placed in charge of oxygen and/or fuel-gas supplies must be trained and deemed competent for such work. All personnel must be familiar with the requirements listed in 29 CFR 1910.253(a)(4),: NFPA 51B-1999 2-1.4, 29 CFR1910.254(d)(1), 29 CFR 1910.252(a-c); NFPA 51B 1999

Personal protective equipment

Welders must make sure that every person in the welding area is wearing the correct personal protective equipment. This table outlines the required personal protective equipment for various welding activities.

Activity	Required Equipment
arc welding	• ANSI approved helmet • leather welding gloves • hood with the filter lens or plates listed below: ❍ metal arc welding: shade no. 10 ❍ gas arc welding: shade no. 11 ❍ electrodes of 3/16 to 3/8: shade no. 12 – 14 ❍ hydrogen/carbon arc welding: shade no. 14
using a cutting torch	• leather welding/cutting gloves • approved dark goggles that seal around the eyes. These goggles must be at least shade numbers 3-6. Denser shades may be used to suit individual needs

observing welding	welding goggles **OR** a shaded shield with minimum shade no.10
brazing or welding alloys or other exotic metals	• ANSI approved helmet • leather welding/cutting gloves • respiratory protection: • medical evaluation for respiratory by a LHCP ❍ respirator approved for use with welding fumes **OR** ❍ vent hood **OR** ❍ proper ventilation

Shaded safety glasses are **not** acceptable for welding.

Preventing Fires

Purpose

This document describes the safety policies for welding containers and preventing fires.

Welding containers

Never burn the head out of a drum. Use a drum-cutting tool (cold cut).

Only weld the following containers as a last resort:

- vessels
- tanks **OR**
- other enclosures previously in service

Never weld on a frac tank before doing the following:

1. complete a JSA
2. complete a hot work permit
3. clean and wash the tank thoroughly
4. check the space for gas (0% LEL)
5. purge and ventilate with clean air
6. open the tank so that air can circulate freely through it

Fire protection

Always have a fire extinguisher within reach when welding. **IF** no fire extinguishers are available, **THEN** do not weld until a fire extinguisher is available.

The following table summarizes additional requirements for specific welding operations.

IF you are welding…	THEN…
on a rig,	use a gas detector or sniffer on the welding pipe
in a confined space,	have a trained fire watch person present with a fire extinguisher
near combustible material,	have a fire extinguisher within reach
in the field or anywhere outside of a controlled shop environment,	have a fire watch person present during welding and cutting with a fire extinguisher

For more information, see the chapter entitled *Fire Protection*-in this manual.

Performing Welding/Cutting

Purpose

This document describes the safety procedures to follow before and after welding.

Preparing the equipment

Follow these steps to prepare the welding equipment.

Step	Action
1	Inspect personal protective equipment. Helmet, gloves, and clothing must be in good repair and must cover exposed parts of the body.
2	Wash, clean, and purge air vessels.
3	Inspect welding cables for damage or wear. Ensure that no cables with splices are within 10 feet of the welder.
4	**IF** the welding cable is coiled, **THEN** spread it flat.
5	Make sure you are not welding over cables, electric cords, or hoses.
6	Inspect pipes, hoses, and fittings. **IF** they are leaking, **THEN** do not use them. Have them repaired or changed immediately.
7	**IF** you are using a cutting torch, **THEN** inspect the torch for damage or wear. **Never** use a leaky hose or torch.
8	Attach a ground lead to the object being welded with an approved clamp.
9	Secure fuel-gas and oxygen cylinders with the valve end up.
10	Perform a gas vapor check.
11	Ask your supervisor for a **hot work permit** to begin work.
12	**IF** there are any safety questions, **THEN** contact the Safety Department.

Opening cylinders

Never open a valve near welding work, sparks, or flammable materials. Follow these steps to open the oxygen and fuel-gas cylinders before welding.

Step	Action
1	Release tension on the regulator adjusting screws by turning them counterclockwise.
2	Stand so the cylinder valve is between you and the regulator. **Never** stand directly in front of or behind a regulator when opening the cylinder valve.
3	Slowly and carefully open the cylinder valve until the pressure gauge shows maximum pressure.
4	Open the oxygen cylinder valve completely to seal the valve packing.
5	Repeat Steps 1-4 with the fuel-gas regulator and cylinder.

Checking for leaks

Check for leaks in the hose and the valve every 3 to 6 months or as needed.

IF:
- the cylinders don't last as long as they should
- you hear oxygen hissing **OR**
- you smell acetylene,

THEN there may be a leak.

Use soap and water to check for it. Squeeze one drop at a time on the hose, regulator valve and/or cylinder valve. **IF** you see bubbles, **THEN** the hose or valve is leaking.

IF the leak is in the…	THEN…
hose,	replace the defective hose
regulator valve,	tighten the connection
cylinder valve,	place the cylinder outdoors and notify your supervisor immediately. Do **not** tighten a cylinder valve.

Lighting the torch

Use a friction lighter or other approved device to light the torch. Do **not** use a match or a cigarette lighter.

After welding

When you have finished welding:

1. close the valves of:
   - acetylene cylinders
   - oxygen cylinders
   - supply lines
2. check the area for smoldering fires and extinguish them
3. roll up the cables
4. clean the area