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Purpose:

The purpose of this standard is to outline procedures and policies around hot work and hot tapping to ensure that these practices are completed safely.

GENERAL REQUIREMENTS

Authorized hot work areas for welding and cutting shall be free of flammable and combustible materials, provided with adequate fire extinguishing and first aid equipment, and properly screened off to prevent viewing of welding operations.

Welding and cutting shall not be performed if they cannot be performed safely.

Cutters, welders, and their supervisors shall be suitably trained in the safe operations of their equipment and the use of the process.

HOT WORK PERMITS

Permits for Hot Work are required for all hot work processes including welding, cutting, and brazing operations exclusive of those areas designated as authorized free-burn areas. Only the Plant Manager shall issue permits.

When hot work is to be performed outside of a hot work area, the employee or contractor performing the hot work shall complete a Hot Work Permit **before** commencing work. Upon completion of the work, the permit shall be turned in to the Plant Manager.

The Plant Manager shall retain returned permits for a minimum of two (2) months from the date of return.

A new permit shall be completed where there is an interruption in the work process, such as meal breaks, shift changes, work condition changes or generally left unmonitored for significant periods of time.


Before beginning hot work activities, the affected area(s) shall be inspected and results documented on the Hot Work Permit.

Only employees designated by the Plant Manager can use flame or spark producing equipment.

Air monitoring shall be conducted prior to starting hot work and the results shall be documented on the hot work permit.

FIRE PREVENTION AND PROTECTION

If the object to be welded or cut cannot be readily moved to an area designated for hot work, all moveable fire hazards in the vicinity shall be moved at least 35 feet from the work site.

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Combustibles and flammables that cannot be relocated shall be isolated from ignition sources by flameproof covers or otherwise shielded with metal or fire-resistant guards or curtains.

Appropriate fire extinguishing equipment shall be readily available for use whenever hot work is performed.

A Fire Watch standby shall be provided:

- For a minimum of thirty (30) minutes after the completion of hot work activities
- When combustible materials are closer than 35 ft. (10.7M) to point of operation
- When combustible materials are 35 ft. (10.7M) or more away but are easily ignited
- When wall or floor openings within 35 feet (10.7M) radius expose combustible materials
- When combustible materials are adjacent to the opposite side of metal partitions, ceilings or roofs.


Personnel assigned to perform "Fire Watch" duties shall be trained prior to assignment to perform such duties. Training shall include:

- Use of firefighting equipment such as extinguishers and water hoses
- Emergency notification procedures
- Property of fires
- Duties of a "Fire Watch"
- Potential hazards
- Use of emergency equipment

The Plant Manager is responsible for ensuring personnel assigned to perform "Fire Watch" duties have received adequate instruction and training.

The primary responsibility of a "Fire Watch" is to monitor for potential fire hazards and the presence of fire during operations such as welding and cutting. This includes:

- Having the ability to communicate to employees (including all languages spoken by employees performing work in the area being monitored)
- Continuously monitor the area surrounding the immediate work area for conditions that could result in a fire or explosion
- Immediately stop all "hot work" in the event of an emergency or other unplanned event affecting the safety of employees
- Know the permit requirements relative to fire protection and ensure they are being followed as work is being performed
- Extinguish fires when they occur if possible. When a fire occurs, all work must be discontinued and the Plant Manager must be notified immediately
- When a fire or fire potential is not controllable, follow applicable emergency procedures
- Remain at the assigned location at all times, except when evacuating
- Perform no other work that will interfere with fire watch duties

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- Remain at the work site for at least 30 minutes after hot work operations have ceased to ensure smoldering other potential fire conditions do not exist
- Upon completion of work and it is determined smoldering fires are not present, the "Fire Watch" is responsible for returning and/or storing firefighting equipment to its original location as directed by the Plant Manager

COMPRESSED GAS CYLINDERS

Workers in charge of oxygen or fuel-gas supply equipment (including distribution piping systems and generators) must be instructed and judged competent for such work by the Plant Manager.

Empty cylinders shall be labeled as such and kept separate from full cylinders.

Use cylinders in an upright position, particularly those containing liquefied gas or acetylene.

When transporting cylinders, they shall be secured, gauges removed, kept in an upright position and capped.

Cylinders shall be secured against being knocked over with a non-combustible restraint such as a chain.

Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially gasoline, oil or grease) for a minimum of twenty (20) feet or by a non-combustible barrier, at least five (5) feet in height having a fire-resistance rating of at least one-half hour. (OSHA considers a cylinder to be "in storage" when it is reasonably anticipated that gas will not be drawn from the cylinder within 24 hours (overnight hours included).

The metal cylinder cap shall be in place to protect the valve when a cylinder is not connected for use.

Make sure the threads on a regulator or union corresponds to those on the cylinder valve outlet. *DO NOT* force connections that do not fit.


Open cylinder valves slowly. A cylinder not provided with a hand wheel valve shall be opened with a spindle key or a special wrench or other tool provided or approved by the gas supplier or manufacturer.

DO NOT use a cylinder of compressed gas without a pressure-reducing regulator attached to the cylinder valve, unless attachment is to a manifold that contains its own regulator.

Before making connection to a cylinder valve outlet, "crack" the valve for an instant to clear the opening of particles of dust or dirt. Always point the valve and opening away from the body and not toward anyone else. NEVER crack a fuel gas cylinder valve near other welding work, sparks, open flames or other sources of ignition.

Use regulators and pressure gauges only with the gases for which they were designed and intended. DO NOT attempt to repair or alter cylinders, valves or attachments. The glass face of gauges shall be kept intact or replaced prior to use.

Gauges shall be turned off and hoses shall be 'bled' when not in use.

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All fuel-gas welding, burning, cutting equipment shall be equipped with a check valve (flash arrestor), preferably located at the torch-end of the system.

ENERGY CONTROL (LOCKOUT)

When systems must be shut down to accomplish the hot work, the shutdown shall be performed in accordance with the Lockout Tagout Program.

WELDING OR CUTTING OF CONTAINERS AND PIPING

No hot work shall be performed on used drums, barrels, tanks, or other containers until it can be determined that no flammable materials or other materials are present which, when subject to heat, might produce flammable or toxic vapors. Containers shall be adequately vented to the atmosphere to prevent explosion. When containers do contain flammable or toxic materials, the following precautions shall be taken:

- Piping to the containers shall be disconnected or blanked off
- The container shall be cleaned of the flammable or toxic materials; and/or
- The container shall be purged with an inert gas
- After purging is completed, the atmosphere in the container shall be sampled to ensure it is safe for hot work

If the above precautions cannot be accomplished, the container shall be filled completely with water before the hot work is performed.

VENTILATION

Adequate ventilation (natural, mechanical, or respirator) shall be provided for all hot work operations to ensure permissible exposure levels are not exceeded.


Before hot work is commenced on any surface covered by a preservative coating whose composition is not known, a test shall be made by a competent person for hazard determination. Work processes shall be modified based on the test results.

When welding, cutting or burning galvanized or cadmium plated metal, local exhaust ventilation or a respirator shall be required.

PPE

All outer clothing shall be free from oil or grease.

Synthetic or plastic clothing shall not be worn.

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Welding helmets and face shields shall be used to protect the face, forehead, neck and ears from direct radiant energy from the arc and from weld spatter.

Sleeves and collars shall be kept buttoned. Pockets shall be emptied of flammable or readily combustible material. Pants shall not have cuffs and shall not be turned up on the outside. Pants shall overlap shoe tops to prevent spatter from getting into shoes.

If respiratory protection is required, respirators shall be used in accordance with the Big Ox Energy – Riceville, LLC Respiratory Protection safety policy.

Fire resistant screens or curtains shall be used around the welding area to protect-passers-by from flying sparks and direct view of the arc.


Employees assigned to operate arc welding equipment shall be properly instructed and qualified to operate such equipment. They shall also be familiar with the Occupational Safety and Health standard, section 1910.254 and with 1910.252(a)(b) & (c). Operators of equipment shall report any equipment defect or safety hazards and discontinue use of equipment until its safety has been assured. Repairs shall be made only by qualified personnel.

When welding or cutting with covered electrodes using alternating current (AC) single-phase transformer-rectifier arc welding machines and under electrically hazardous conditions, the welding operator shall use dry gloves and clothing, non-conductive footwear, and avoid accidental contact with live electrical parts.

Filter Lens Shades shall be selected in accordance with the table below:

Welding Operation	Suggested Shade Number
Shielded metal-arc welding, up to 5/32 in. (4 mm) electrodes	10
Shielded metal arc welding, 3/16 to 1/4 in. (4.8 to 6.4 mm) electrodes	12
Shielded metal-arc welding, over 1/4 in. (6.4 mm) electrodes	14
Gas metal-arc welding (nonferrous)	11
Gas metal-arc welding (ferrous)	12
Gas tungsten-arc welding	12
Atomic hydrogen welding	12
Carbon arc welding	14
Torch soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 in. (25 mm)	3 or 4
Medium cutting, 1 to 6 in. (25 to 150 mm)	4 or 5
Heavy cutting, over 6 in. (150 mm)	5 or 6
Gas welding (tight) up to 1/8 in. (3.2 mm)	4 or 5
Gas welding (medium) 1/8 to 1/2 in. (3.2 to 12.7 mm)	5 or 6
Gas welding (heavy) over 1/2 in. (12.7 mm)	6 or 8

The choice of a filter shade may be made on the basis of visual acuity and may therefore vary widely from one individual to another, particularly under different current densities, materials, and welding processes. However, the

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degree of protection from radiant energy afforded by the filter plate or lens chosen to allow visual acuity shall still remain in excess of the needs of eye filter protection. Filter plate shades as low as shade 8 have proven suitably radiation-absorbent for protection from the arc welding processes.

NOTE: In gas welding where the torch produces a high yellow light, it is desirable to raise a filter lens that absorbs the yellow or sodium line in the visible light of the operation (spectrum).

SAFETY PROVISIONS

The following safety provisions must be followed during all hot work:

- Fire Protection Equipment must be located at the immediate worksite, ready to use.
- A serviceable Class ABC fire extinguisher, as a minimum, shall be immediately available at a hot work site, especially a welding and cutting site.
- Welding ground returns shall be placed on the material being welded and adjacent to the area.
- Where possible, welding shall be conducted on dry ground and with dry gloves and clothing to reduce electrocution hazards.
- Suitable shielding must be placed around the welding and grinding operations to protect personnel in the area whom do not otherwise have PPE.
- When conducting overhead welding and cutting operations, safeguards must be installed to protect the workers and equipment below, including hoses, cables and cylinders from falling slag and sparks.
- All manufacture specifications shall be adhered to.
- The electrode shall be removed when leaving the electric welding machine unattended.
- Welding equipment shall only be used within its rated capacity.
- Welding should be stopped if any abnormal equipment condition arises.
- Do not operate portable arc welders indoors.
- Qualified mechanics or technicians should do all repairs.
- Turn off welding machines at the end of each day and when left unattended.
- Ensure all side covers are in place to protect the machine from any damage and weather and protect the operator and others from the moving parts of the machine.
- Make sure that all cable and hoses are wound securely when transporting.
- Open all cylinder valves slowly.
- The wrench for opening the cylinder valves should always be kept on the valve spindle when the cylinder is in use.
- Oxygen and acetylene shall be turned off when not in use.
- Never set down a burning torch.
- Welding leads shall not be allowed to remain wet.
- Defective welding leads shall be repaired or replaced immediately.
- If the lead is repaired, the tape shall be the same thickness and shall provide the same protection as that of the original insulation.
- Welding leads shall be kept out of walkways and aisles and shall be rolled up at the end of each shift.
- Do not handle the electrode holders from two different welding machines at the same time.
- Welding cable should not be looped over the shoulders or around any part of the body.
- No worker when welding shall be in possession of strike anywhere matches or BIC style lighters in their

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pockets. All oxygen and acetylene bottles shall be stored upright and secured not inside an enclosed building, caps shall be secured, segregated and content marked, and stored away from electrical contact and heat.

OTHER REQUIREMENTS

Insubordination in regards to this standard will be dealt with as per Big Ox Energy - Riceville LLC's Disciplinary Program.