

Job Hazard Analysis

JHA Name: Electric Welding



Assessment Date: 07-23-13

Revision Date: 04-14-17

Building or Location: Faribault & North Mankato Campuses

Department or Program: Welding, Ag Mech, Auto Mech, Auto Coll,

Description of Individual Tasks or Assignments:

Electric Welding Applications: Manual Metal Arc Welding (MMA) i.e., Stick Welding; Gas Metal Arc Welding (GMAW) e.g., MIG or MAG; and Gas Tungsten Arc Welding (GTAW) i.e., TIG

Tools, Equipment, or Machinery Used when Performing Task:

Welders (e.g., Stick, MIG, TIG), Cylinders containing shielding gases (e.g., helium, argon, carbon dioxide, oxygen, nitrogen, and hydrogen), and Welding Wire, Flux and Rods

Hazard Type(s) Associated with Task or Assignment:		Check for Exposure:	Specific Hazard Exposure:	Check if Exposure Recommends or Requires a Style of PPE?
1	Impact <u>Example:</u> Person(s) can strike an object, or be struck by a moving or flying/falling object (e.g., fragments, chips, particles, sand, dirt/debris).	X	Potential exposure to flying fragments, particles and debris generated from welding (e.g., injuries to eyes and face)	X
2	Penetration or Cut <u>Example:</u> Person(s) can strike an object, be struck by an object, or fall upon an object or tool that would cut or otherwise break the skin.	X	Potential exposure to cuts and abrasions when handling metal pieces with rough or sharp edges (e.g., hand and finger injuries)	X
3	Crush or Pinch <u>Example:</u> An object(s) or equipment/machine may crush or pinch a body or body part	X	Potential exposure to crushing and pinching hazard from dropping metal pieces and fixtures (e.g., injuries to feet)	X
4	Chemical or Harmful Dust <u>Example:</u> Exposure to chemicals (i.e., hazardous substances and harmful physical agents), infectious agents from spills, splashing, physical contact, and or exposure to dusts, vapors, fumes, or gases that could cause illness, irritation, burns, asphyxiation, breathing/vision difficulty, sensitization, infection, or other toxic health effects (i.e., acute or chronic). Note: "May also have or create ignition potential."	X	Potential exposure to Welding Fumes (dependent on type of work being done, rod, filler metals, base metals, surface coatings, contaminants; as well as, the amount of ventilation) (e.g., respiratory illness), potentially harmful physical agents presented from compressed gas cylinders (e.g., damaged/ruptured tanks, leaking tank or connections, improper storage/securing, simple asphyxiation/suffocation, etc...)	X
5	Heat <u>Example:</u> Exposure to radiant heat sources, sparks, and splashes or spills of hot material	X	Potential exposure to flying sparks generated from welding (e.g., injuries to eyes/face, fire hazards), radiant heat sources (i.e., hot metal parts/pieces) (e.g., injuries to hands/arms, fire hazards)	X
6	Light (optical) Radiation <u>Example:</u> Exposure to strong light sources, glare, or intense light exposure which is a byproduct or a process. Note: "This category may also include hazards presented from lack of light (e.g., working in dark spaces/areas)."	X	Potential exposure to UV radiation generated from welding (e.g., injuries to eyes and exposed skin), other personnel (in areas where welding is performed) have potential exposure to welding flash/UV radiation (e.g., injuries to eyes)	X
7	Electrical Contact <u>Example:</u> Exposure, contact, or proximity to live or potentially live electrical objects.	X	Potential exposure to electric current generated from welding process (e.g., shock and electrocution)	
8	Ergonomic/ Human Factors <u>Example:</u> Working in cramped spaces, repetitive movements, awkward postures, vibration, heavy lifting, etc. Note: "This category may also include unique hazards presented from tasks that require demanding or challenging degrees of mental and/or physical effort to be exerted by an individual. See <i>Physical Effort Definition/Examples</i> category for further explanation of physical effort."	X	Potential exposure to sources worker discomfort/fatigue from workplace setup (e.g., Muscular Skeletal Disorders and fatigue), potential exposure to repetitive movements, lifting light to moderately heavy loads, and bending (e.g., Back and other Muscular Skeletal Disorders)	
9	Environmental <u>Example:</u> Exposure to noisy environments, hot or cold work environments, poor weather conditions, working at a height, and any other conditions in the workplace that could cause danger, discomfort, and/or negative health effects.	X	Potential exposure to loud/prolonged noise (welding process), high heat/temperatures (welding process and warm weather months)	X

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Personal Protective Equipment Requirements:

Eyes & Face:	Welding Helmet (with appropriate lens shade for work performed) worn over Safety glasses with Side Shields (Required whenever striking an arc)
Head & Ears:	Welding Helmet (with appropriate lens shade for work performed) worn over Safety glasses with Side Shields (Required whenever striking an arc)
Whole Body:	Welding Jackets and Sleeves (cotton or leather) (Required whenever welding)
Feet:	Safety Shoes (Required when welding and handling heavy metal parts/pieces)
Hands:	Leather Gloves (Required when welding and when handling metal pieces with rough or sharp edges)
Respiratory:	N95 Particulate Masks (Optional/Available when working around nonhazardous levels of welding fumes), Appropriate 1/2 Mask, Full Face, Supplied Air, etc. (Required when welding fume levels exceed OSHA PELs)
Other:	

Other Control Measures or Requirements (Engineering & Administrative Controls):

#4) Chemical or Harmful Dust Hazards: Personnel should receive Right-to-Know training (e.g., regarding chemical & physical hazards). SDS should be provided/available for all hazardous chemicals. Personnel should receive Compressed Gas Cylinder training (e.g., regarding transporting, handling, and storing procedures). Personnel should never weld/cut any containers that previously held flammable or combustible materials. To prevent further accidental chemical exposure, remove any paint/coatings on metal surfaces prior to welding on them. Welding areas should have Industrial Hygiene sampling performed to determine welding fume levels. Periodic Industrial Hygiene testing should be performed per regulatory requirements, at regular intervals, and whenever there are: changes in welding processes, materials, or equipment; significant increases or decreases in personnel welding; air quality complaints/concerns, etc... Respirators are available for personnel experiencing respiratory discomfort from welding fumes generated; however, personnel (desiring to use respirators) and personnel required to wear respiratory equipment should receive a medical evaluation, Respirator training (e.g., regarding respiratory hazards), and fit-testing prior to wearing respirators. Local Exhaust Ventilation (LEV) should be provided/maintained to reduce exposure levels of welding fumes in all welding areas. Personnel may also use industrial grade fans to locally remove/disperse welding fumes from their area. **#5) Heat Hazards:** All welding should be performed in areas designated for hot work operations. Welding performed in areas not designated for it must be conducted through a Hot Work Permit Program. A Hot Work Permit Program takes proactive actions to reduce chances of fires. This includes: removing or covering potential fire/ignition hazards, performing housekeeping tasks, providing adequate fire protection equipment, conducting fire watches, etc. **#6) Light (optical) Radiation Hazards:** To protect personnel whom occupy or enter welding areas, all welding stations should be guarded with welding curtains or barriers to prevent accidental welding flash/UV radiation exposure. **#7) Electrical Contact Hazards:** In most welding operations, it is better to clamp the current return cable close to where you're welding (avoid rusty surfaces). When welders must be positioned on the metal work pieces, provide an insulating mats or other dry platforms (e.g., wooden pallet or rubber floor mat generally will suffice) to place barriers between welders and metal surface. **#8) Ergonomic Hazards:** Personnel should receive Ergonomics training (including warning signs and conditions of ergonomic/human factors hazards). When possible set up workstation or immediate job site to help minimize reaching, and/or sitting or working in awkward positions to prevent strains, soreness, and other discomfort. Tools and equipment should be selected in anticipation of the operator's need and physiological stature (e.g., ergonomic/human factors considerations). Material handling equipment should be used to reduce lifting and carrying materials. Use jigs to support heavy or awkward work pieces being welded, and clamp small parts/pieces to keep hands away from danger. **#9) Environmental Hazards:** Personnel should receive Hearing Conservation training (e.g., regarding noise hazards), and be included in the Hearing Conservation Program when potentially exposed to a TWA of 85dB. Personnel should be trained in the basic understanding of heat stress and recognizing warning signs. Personnel should take more frequent short breaks on hot days in shaded or air-conditioned areas. Personnel should drink plenty of cool beverages (water), and avoid drinks with caffeine (coffee, tea, or pop). When possible schedule/perform work during the coolest part of the day. **Miscellaneous Considerations:** Operators of tools, equipment, and machinery should read and follow all Manufactures' recommendations/requirements (e.g., inspections, servicing/maintenance, safe usage, etc.). Any tools, equipment, or machinery found damaged, defective, or otherwise unsafe should immediately be removed from service and not used until repaired or replaced. Personnel should always consult their Supervisors on the selection and use of PPE for the tasks being performed.

Physical Effort Definition/Examples

1.) Physical Mobility- Movement from place to place on the job, considering distance and speed **2.) Physical Agility-** ability to maneuver body while in place or in static position **3.) Physical Strength (Light to Moderate)-** Ability to handle routine office materials and tools **4.) Physical Strength (Moderate to Heavy)-** Ability to handle 50lbs+ objects, considering frequency **5.) Dexterity-** skill and ability in using hands, fingers, and feet **6.) Physical Balance-** ability to maintain balance and physical control **7.) Coordination-** harmonious functioning of body parts (e.g., eye/hand, hand/foot, etc.) **8.) Endurance-** ability to sustain a prolonged stressful effort or activity with limited opportunity to rest

Note: "This JHA provides only the minimum PPE/safety requirements necessary to safely complete the task or assignment, and the JHA only covers the hazards or exposures that are most likely to be encountered. Nothing within this JHA bars or restricts personnel from requesting higher degrees of PPE or control to mitigate workplace hazards. In addition, South Central College personnel (e.g., employees and students) are required to complete any applicable safety or on-the-job trainings required prior to performing their positions or participating in their programs of study. Finally, South Central College personnel should consult their supervisors/instructors, the college's written safety programs/policies, and/or the Security & Safety Director whenever they have questions or concerns."

Certification: This document certifies a hazard assessment was conducted meeting the provisions specified under 29 CFR 1910.132 (d) and South Central College's related safety programs and policies.

Name: Al Kluever

Date: 04-14-17