

Welding and Cutting JSA

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Learning and planning resource. Adapt with the people doing the work, verify actual controls and follow required authorization. This document supplies no completed field inspections, signatures or work approval.

Work and worksite

Fictional example: a construction crew will cut new, identified uncoated mild-steel brackets with oxy-fuel equipment, then weld them at a ground-level outdoor fabrication station. A delivery route and combustible packaging are nearby. The work excludes vessels, used containers, structural demolition, confined spaces, and unknown coatings. No inspection or permit has been completed by this example; the responsible supervisor must establish the actual conditions before authorizing work.

- Record the welding process, base metal, filler, coatings, equipment models, and applicable safety data sheets. A change to galvanized or stainless material requires reassessment.
- The station has a firm working surface and an exclusion area that can keep deliveries, pedestrians, and other trades outside the hot-work exposure.
- Identify the hot-work authorization process, trained operators, fire-watch coverage, suitable extinguishers, emergency contact method, and the person responsible for closing the work.
- Outdoor air movement is variable. The exposure assessment must consider nearby workers as well as the welder; being outside does not establish adequate fume control.

Actual project records needed: Location, crew and responsible people; equipment models and instructions; permits/releases; emergency arrangements; actual checks and approvals.

Task | Hazard | Control | Verification

Confirm material and work boundaries

Hazard: An unidentified coating or residue releases hazardous contaminants when heated; a nearby flammable process ignites.

Control: The supervisor verifies the material and process information before selecting controls. Move hot work to the designated station. Stop when material identity or previous contents are unknown.

Verification: Identify the material record and inspect both the workpiece and surrounding operations; resolve discrepancies before hot work.

Reasoning: The same torch can create very different exposures on clean steel, coated steel, and a used container.

Prepare the fire-control area

Hazard: Sparks, slag, or conducted heat reach packaging, hidden openings, or people beyond the visible workplace.

Control: Remove movable combustibles; protect remaining exposures with suitable barriers. Examine openings and opposite surfaces. Assign a trained fire watch where normal precautions are insufficient and make suitable extinguishing equipment immediately available.

Verification: The supervisor and fire watch walk the exposure area, identify alarm and evacuation actions, and record the required watch and follow-up periods.

Reasoning: A clear tabletop is insufficient when hot particles or heat can travel beyond it.

Set up welding and gas equipment

Hazard: Damaged leads cause electric shock; a falling cylinder or leaking hose releases fuel or oxygen.

Control: Inspect leads, holders, return connections, hoses, regulators, and torches. Remove defective items. Secure cylinders upright and protect them from heat and impact. Keep oxygen equipment free of oil and grease; route leads and hoses away from traffic.

Verification: The operator checks the specific equipment instructions and verifies safe isolation and shutdown methods before connection.

Reasoning: An equipment inspection connects the generic JSA to the actual machine and gas set being used.

Establish fume, radiation, and personal protection

Hazard: Fumes enter breathing zones; the arc or hot metal burns eyes and skin of workers and passersby.

Control: Select ventilation from the material/process exposure assessment; position source capture when needed without directing contaminants at others. Install welding screens. Select appropriate filter shade, eye protection, gloves, protective clothing, and hearing protection. Use respirators only through the required respiratory-protection program.

Verification: The designated exposure assessor confirms control selection; operators verify screen coverage and ventilation performance using the established assessment method.

Reasoning: A helmet protects the wearer from the arc but does not establish protection against airborne contaminants.

Cut and weld the secured workpiece

Hazard: Unsupported offcuts fall, hands enter pinch points, or changing conditions defeat the fire and fume controls.

Control: Support and restrain the workpiece and offcuts before cutting. Keep people outside the spark and drop zones. Maintain the selected controls throughout work; stop for a gas leak, failed extraction, encroachment, or unsafe weather.

Verification: The operator checks supports before each cut and confirms fire-watch availability and protection of adjacent workers.

Reasoning: Securing an offcut before separation prevents an otherwise predictable falling-object event.

Shut down and close the hot work

Hazard: Residual heat ignites concealed material after departure; hot steel burns another worker; gas remains available at damaged equipment.

Control: Shut equipment down using its instructions, close cylinder valves, and secure the station. Mark or segregate hot pieces. Continue the assigned watch and follow-up inspection for the period required by conditions, the permit, and applicable rules.

Verification: The responsible person records the actual shutdown, watch completion, inspection findings, and unresolved conditions; do not prefill a clearance.

Reasoning: The JSA continues after the arc stops because the ignition source may persist.

Pause and reassess

- Pause for a different alloy/coating, enclosure, ventilation failure, flammable process, or unknown container history.
- Reassess when sparks can reach another level, the watch is relieved, or weather changes the work area.

Correct the condition, revise the analysis, communicate the change and obtain required authorization before restarting.

Improve the control

Needs improvement: Fire: have an extinguisher.

More useful: Trace where sparks and heat can travel, remove combustibles, assign necessary watch coverage, and verify extinguishing readiness.

Needs improvement: Fumes: wear a mask.

More useful: Identify the metal and process, assess exposure, select ventilation, and determine whether a respiratory-protection program is needed.

Decisions that change the analysis

A painted bracket arrives. Can the crew use this example unchanged?

Stop and identify the coating and exposure implications. Confirm removal or other controls before revising the analysis.

The fire watch is called elsewhere. What happens?

Suspend work that depends on that watch until a trained replacement receives the handover and required coverage is restored.

References and adaptation

OSHA 1926.350: Gas welding and cutting

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.350>

OSHA 1926.351: Arc welding and cutting

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.351>

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OSHA 1926.352: Fire prevention

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.352>

OSHA 1926.353: Ventilation and protection

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.353>

This original walkthrough was informed by review of uploaded examples, then rewritten for the stated fictional scenario using current primary references. It does not reproduce a source document or its approval record.

Walkthrough and draft builder: <https://www.toddjeromejenkins.com/jha-jsa-examples/welding-cutting-jsa>