

OSHA Welding Safety Pack

FORBES SAFETY SOLUTIONS

Complete bundle — 7 templates included

Editable Word/Excel/PowerPoint versions available at forbessafety.com/downloads/

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WELDING EQUIPMENT DAILY

Forbes Safety Soluti

Ref: 29 CFR 1926.35

Company:	
Welder Name:	
Date:	
Equipment ID:	

INSPECTION ITEM

#	Inspection Item	Status (Pass/Fail)
1	Welding machine — general condition	
2	Cables/Leads — no damage, proper insulation	
3	Ground clamp — secure and functional	
4	Electrode holder — condition	
5	Gas cylinders — secured and upright	
6	Regulator/Flowmeter — functioning properly	
7	Hoses — no leaks or damage	
8	Ventilation equipment — operational	
9	Welding screens/curtains — in place	
10	Fire extinguisher — present and charged	
11	PPE available and in good condition	

WELDER SIGN-OFF

Welder Signature:	
Date:	

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INSPECTION LOG

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JOB HAZARD ANALYSIS

Structural Steel Welding

Regulatory References: 29 CFR 1926.350-354, AWS D1.1 Structural Welding Code, 29 CFR 1926 Subpart R (Steel Erection)

PROJECT INFORMATION

Project Name:		Date:	
Location:		JHA Number:	JHA-035
Supervisor:		Reviewed By:	
Trade/Activity:	Structural Steel Welding	Permit Required:	☐ Yes ☐ No

JOB HAZARD ANALYSIS

Task Step	Hazard	Risk Level	Control Measures
1. Weld Prep & Joint Fit-Up	Falls from steel (elevated work) Cuts from sharp edges Pinch points during fit-up Grinding sparks/debris	H M M M	100% tie-off when working at height — fall protection per Subpart R Inspect walking/working surfaces for ice, grease, debris Use cut-resistant gloves when handling steel members Verify bolt torque and fit-up alignment before welding Grind joint prep with guarded grinder; wear face shield Secure members with erection bolts/clamps before releasing crane
2. Equipment Setup & Cable Routing	Electrical shock Trip hazards from cables Damaged equipment	H M M	Inspect welding machine, cables, electrode holder, and ground clamp daily Replace damaged cables, connectors, or insulation immediately Route cables to minimize trip hazards; cover or elevate at walkways Ensure proper grounding — ground clamp directly on workpiece or structure Keep welder dry and away from standing water Verify correct voltage/polarity settings for weld procedure
3. Tack Welding	UV radiation (arc flash) Burns from spatter Fume exposure Fire	H M H H	Wear welding helmet (Shade 10-14) and FR clothing for ALL welds including tacks Erect welding screens/curtains to protect adjacent workers from UV Clear combustibles within 35 ft or cover with fire-resistant blankets Position fire extinguisher within 25 ft of welding location Assign fire watch for duration of work plus 30 minutes post-weld Verify adequate ventilation or use local exhaust / fume extraction
4. Multi-Pass Welding	Prolonged fume exposure (Mn, Cr ⁶⁺)	H H	Use local exhaust ventilation (LEV) positioned within 12-18 inches of arc

FORBES SAFETY SOLUTIONS

Task Step	Hazard	Risk Level	Control Measures
	UV radiation Burns Fire Fatigue at height	M H M	Wear P100 respirator with OV cartridge — required for galvanized or stainless steel Monitor exposure to manganese and hexavalent chromium per 29 CFR 1926.1152/1126 Take breaks to prevent fatigue — especially critical at elevated positions Maintain fire watch — continuous observation during multi-pass welding Inspect interpass temperature with contact thermometer per WPS requirements
5. Post-Weld Inspection	Burns from hot steel Falls during inspection Grinding hazards	M H M	Allow welds to cool before handling — test temperature before touching Maintain fall protection during inspection — do NOT remove harness Use magnetic particle or ultrasonic testing per AWS D1.1 inspection requirements Grind repairs with guarded grinder; wear face shield and hearing protection Mark rejected welds clearly for repair; document all inspection results Verify weld meets WPS parameters (size, profile, discontinuities)
6. Cleanup	Hot slag and spatter Welding rod stub disposal Fire from smoldering materials	M L M	Allow all slag and spatter to cool before sweeping up Collect used welding rod stubs in metal container — do NOT leave on steel members Fire watch inspects area 30 minutes after last weld — confirm no smoldering Disconnect and properly store welding cables and equipment Clean work area of all debris, tools, and consumables Complete weld log and daily inspection documentation

Additional Notes: Hot work permit required for all welding operations. Fire watch must remain 30 minutes after welding ceases. All welders must have current AWS certification for the applicable process (SMAW, FCAW, GMAW). Welding on galvanized steel requires enhanced respiratory protection for hexavalent chromium.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Required PPE	
☒ Hard Hat (ANSI Z89.1)	☒ Welding Helmet (Shade 10-14)
☒ Safety Glasses under Helmet (ANSI Z87.1)	☒ Welding Jacket / FR Clothing
☒ Welding Gloves (leather gauntlet)	☒ Steel/Composite Toe Boots
☒ Hearing Protection	☒ Respirator (P100 w/ OV cartridge for fumes)
☒ Fall Protection Harness & Lanyard	☒ Fire-Resistant Boot Covers / Spats

EMERGENCY PROCEDURES

- Fall from steel: Activate rescue plan immediately. Trained rescuers deploy to retrieve fallen worker within minutes to prevent suspension trauma. Call 911.
- Welding fume overexposure (manganese, hexavalent chromium): Move worker to fresh air immediately. Seek medical evaluation. Review ventilation adequacy.
- Burn injury: Cool burn with water. Remove smoldering clothing (not if adhered). Cover with sterile dressing. Seek medical attention.
- Fire from welding sparks: Use ABC fire extinguisher. Activate fire watch procedure. If fire cannot be controlled immediately, evacuate and call 911.
- Electrical shock from welder: De-energize equipment. Do NOT touch victim if still in contact with energized source. Administer CPR if needed. Call 911.
- Arc flash eye injury (flash burn): Irrigate eyes with clean water. Apply cool compress. Seek medical evaluation — symptoms may be delayed 6-12 hours.
- Report all incidents, near-misses, and equipment malfunctions to supervisor immediately.

FORBES SAFETY SOLUTIONS

WORKER SIGN-OFF

By signing below, I acknowledge that I have reviewed and understand this Job Hazard Analysis, the associated hazards, and the required control measures for the work to be performed.

#	Print Name	Signature	Company	Date	Time
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

REVIEW & APPROVAL

Role	Name / Signature	Title	Date
Prepared By			
Reviewed By			
Approved By			
Site Supervisor			

REVISION HISTORY

Rev.	Date	Description	Author
0		Initial Release	
1			

FORBES SAFETY SOLUTIONS

JOB HAZARD ANALYSIS

JHA INFORMATION			
JHA Title:	Welding & Cutting Operations	JHA Number:	FSS-JHA-028
Project Name:		Date:	
Location:		Revision:	0
Regulatory References:	29 CFR 1926.350-354 (Welding & Cutting); ANSI Z49.1 (Safety in Welding, Cutting, and Allied Processes); NFPA 51B (Fire Prevention During Welding)		
Prepared By:		Approved By:	
Competent Person:		Supervisor:	

JOB HAZARD ANALYSIS — TASK BREAKDOWN

Task Step	Hazard	Risk Level (H/M/L)	Control Measures
1. Hot Work Area Preparation	• Fire from combustible materials nearby • Explosion near flammable storage • Inadequate ventilation • Unauthorized area access	H	• Survey 35-foot radius for combustible/flammable materials • Remove combustibles or protect with fire-resistant blankets/shields • Verify no flammable vapors present — use combustible gas detector • Ensure adequate ventilation (natural or mechanical) • Wet down combustible floors/surfaces if they cannot be relocated • Barricade hot work area and post warning signs • Coordinate with other trades to eliminate ignition sources
2. Equipment Inspection & Setup	• Gas leaks from regulators/hoses • Electrical shock from damaged cables • Cylinder tip-over • Flashback into cylinders	H	• Inspect all hoses, regulators, gauges, and connections for damage • Check welding leads and electrode holders for damaged insulation • Secure gas cylinders upright with chains/straps to a stable structure • Verify flashback arrestors installed on oxy-fuel equipment • Test all connections with soapy water for leaks — no open flame test • Confirm ground clamp securely attached to workpiece • Ensure fire extinguisher (minimum 20 lb ABC) within 20 feet
3. Fire Watch Establishment	• Undetected fire ignition • Sparks reaching hidden combustibles • Delayed response to fire • Fire watch leaving post prematurely	H	• Assign trained fire watch with no other duties during hot work • Equip fire watch with appropriate extinguisher and communication device • Fire watch must have clear view of all areas where sparks may reach • Fire watch authorized to stop work if unsafe conditions develop • Maintain fire watch for minimum 30 minutes after hot work ceases • Brief fire watch on alarm procedures and evacuation routes • Document fire watch assignments on hot work permit
4. Welding / Cutting Operations	• UV/IR radiation eye burns (arc eye) • Burns from molten metal/sparks • Toxic fume inhalation (manganese, hexavalent chromium, zinc) • Electrical shock • Noise exposure exceeding 85 dBA	H	• Wear proper shade lens (Shade 10-14 for arc; Shade 3-5 for oxy-fuel) • Use welding screens/curtains to protect nearby workers from UV • Position body to minimize fume inhalation — stay upwind • Use local exhaust ventilation or fume extraction at source • Wear dry insulated welding gloves — never touch electrode with bare hands • Keep body insulated from workpiece and ground • Monitor for fume fever symptoms (zinc) — seek medical attention if ill • Wear hearing protection in high-noise operations
5. Post-Work Fire Watch (30 Min Minimum)	• Smoldering materials • Hidden fire behind walls/ceilings • Delayed ignition of combustibles	M	• Continue fire watch for minimum 30 minutes after completion • Inspect all areas where sparks and heat may have traveled • Check behind walls, below floors, and above ceilings for hot spots • Use thermal imaging camera if available for hidden heat detection • Do not leave area unattended until fire watch period complete

6. Equipment Shutdown & Area Cleanup	• Residual heat on materials • Gas leaks from improperly closed valves • Trip hazards from leads/hoses • Improper cylinder storage	L	• Document fire watch completion time on hot work permit • Close cylinder valves, bleed lines, and release regulator pressure • Disconnect welding leads and coil neatly for storage • Allow hot materials to cool before handling — mark with "HOT" signs • Return cylinders to proper storage (oxygen separated from fuel by 20 ft or firewall) • Replace cylinder caps for transport/storage • Clean work area of slag, spatter, and electrode stubs • Close out hot work permit and file with safety records
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REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE Required	Specification / ANSI Standard	Condition / Notes
Welding Helmet (Auto-Darkening or Fixed Shade)	ANSI/ISEA Z87.1+; Shade 10-14 (arc)	Shade selected based on amperage/process
Safety Glasses (worn under helmet)	ANSI/ISEA Z87.1+ with side shields	Clear or shade 2 for under-helmet use
Flame-Resistant Welding Jacket/Sleeves	ANSI/ISEA 105; ASTM F2302	Leather or FR cotton — no synthetic materials
Welding Gloves (Insulated Leather)	ANSI/ISEA 105; EN 12477	Gauntlet style; dry at all times
Steel-Toe Safety Boots (Metatarsal Guard)	ASTM F2413 (I/75 C/75 Mt/75)	Leather uppers; no lace-up eyelets exposed
Respiratory Protection	NIOSH 42 CFR Part 84; ANSI Z88.2	P100 half-face minimum; SAR for confined areas
Hearing Protection	ANSI S3.19 / S12.6 (NRR ≥ 25 dB)	Required during grinding and high-amp welding
FR Skull Cap / Beanie	NFPA 2112	Protect scalp from spark/spatter

EMERGENCY PROCEDURES

Fire During Hot Work:

- Fire watch activates alarm and attempts extinguishment with provided extinguisher
- If fire exceeds extinguisher capability, evacuate area immediately
- Call 911 — provide location, type of fire, and materials involved
- Shut off gas cylinders if safe to do so
- Activate site fire alarm and evacuate to assembly point
- Account for all personnel at assembly area

Burn Injury:

- Remove victim from heat source to safe area
- Cool burns immediately with clean, cool water (20 minutes minimum)
- Remove clothing/jewelry near burn (do not remove if adhered to skin)
- Cover with sterile, non-adherent dressing
- Call 911 for second-degree burns larger than palm size, or any third-degree burns
- Do not apply butter, ointment, or ice to burns

Fume Inhalation / Respiratory Distress:

- Move victim to fresh air immediately
- Call 911 if victim has difficulty breathing, dizziness, or confusion
- Administer supplemental oxygen if trained and available
- Monitor for metal fume fever symptoms (flu-like onset 4-12 hours post-exposure)
- Provide EMS with welding rod/base metal SDS information

Emergency Contact Information:

- Emergency Services: 911
- Site Safety Manager: [Insert Name & Phone]
- Nearest Hospital: [Insert Name, Address & Phone]
- Poison Control: 1-800-222-1222
- Fire Department Non-Emergency: [Insert Local Number]

WORKER SIGN-OFF — I HAVE READ AND UNDERSTAND THIS JHA

#	Print Name	Signature	Company / Trade	Date
1				
2				
3				
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5				
6				
7				
8				
9				
10				

REVIEW & APPROVAL

Role	Name / Signature	Date	Initials
Prepared By (Author)			
Reviewed By (Safety Manager)			
Approved By (Project Manager)			
Client / Owner Rep			

This JHA must be reviewed and updated whenever job conditions change, after any incident, or at minimum annually.

HOT WORK PERMIT

Forbes Safety Solutions

Ref: 29 CFR 1926.352 | NFPA 51B



THIS PERMIT IS VALID FOR A SINGLE SHIFT

Company:	
Location:	
Date:	
Time Start:	
Time End:	
Type of Hot Work:	(Welding / Cutting / Brazing / Grinding / Other)

PRE-WORK SAFETY CHECKLIST

#	Checklist Item	Yes	No	N/A
1	Fire watch assigned?			
2	Fire extinguisher within 20 ft?			
3	Combustibles removed/covered within 35 ft?			
4	Sprinkler system working?			
5	Floors swept of debris?			
6	Openings/cracks in walls/floors covered?			
7	Ventilation adequate?			

FIRE WATCH

Fire Watch Name:	
Fire Watch Duration:	
Post-Work Fire Watch (min 30 min):	
Fire Watch Completion Sign-Off:	

Note: Fire watch must continue for a minimum of 30 minutes after hot work is completed.

AUTHORIZATION SIGNATURES

Requester Name:		Signature:
Issuer (Safety/Supervisor):		Signature:
Fire Watch:		Signature:

THIS PERMIT EXPIRES AT THE END OF THE CURRI

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	Notes





	Date: _____
	Date: _____
	Date: _____

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HOT WORK PERMIT PROGRAM

Written Safety Program

Per 29 CFR 1910.252 & NFPA 51B

[COMPANY NAME]

[Company Address]

Effective Date: _____

Revision Date: _____

Prepared by Forbes Safety Solutions

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9.0 Contractor Requirements
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Appendix A: Hot Work Permit Form

1.0 Purpose and Scope

The purpose of this Hot Work Permit Program is to establish procedures and requirements for the safe performance of hot work operations at [Company Name] facilities and jobsites. This program is designed to prevent fires, explosions, and injuries resulting from welding, cutting, brazing, soldering, grinding, and other spark-producing operations.

This program applies to all employees, contractors, and subcontractors who perform or supervise hot work operations. It complies with the requirements of:

- OSHA 29 CFR 1910.252 — General Requirements for Welding and Cutting
- OSHA 29 CFR 1926.352 — Fire Prevention (Construction)
- NFPA 51B — Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- NFPA 241 — Standard for Safeguarding Construction, Alteration, and Demolition Operations

2.0 Definitions

Hot Work: Any operation that involves open flames, produces sparks, or generates sufficient heat to ignite flammable or combustible materials. This includes, but is not limited to, welding, cutting, brazing, soldering, grinding, thermal spraying, and thawing pipes with open flames.

Hot Work Permit: A written authorization issued by a designated authority that documents the fire safety precautions in effect for a specific hot work operation at a specific location and time.

Fire Watch: A trained individual stationed at or near a hot work operation to watch for fires and be ready to use fire-extinguishing equipment. Required during hot work and for a minimum of 30 minutes after work is completed.

Designated Hot Work Area: A permanent or semi-permanent location specifically designed, maintained, and approved for hot work operations, where combustible materials are controlled.

Prohibited Area: A location where hot work is not permitted under any circumstances, including areas with flammable atmospheres, near explosive materials, or in areas not authorized by management.

Competent Person: An individual who is capable of identifying hot work hazards, has the authority to take corrective action, and is designated to authorize hot work permits.

Permit Authorizing Individual (PAI): The person responsible for reviewing fire safety conditions at the hot work site, issuing the hot work permit, and verifying that all safety precautions are in place.

3.0 Responsibilities

3.1 Management

- Designate Permit Authorizing Individuals (PAIs) for all work areas
- Ensure adequate resources for fire prevention equipment and training
- Review and update this program annually or when conditions change
- Establish and maintain designated hot work areas

3.2 Permit Authorizing Individual (PAI)

- Inspect the hot work area before issuing permits
- Verify all fire prevention measures are in place
- Issue and post hot work permits at the work location
- Assign qualified fire watch personnel
- Cancel permits if conditions change or precautions are not maintained

3.3 Hot Work Operators

- Obtain a valid hot work permit before beginning any hot work
- Inspect equipment before use and report defects
- Comply with all permit conditions and fire prevention measures
- Stop work immediately if unsafe conditions develop

3.4 Fire Watch Personnel

- Maintain continuous observation during hot work and for a minimum of 30 minutes after completion
- Have fire-extinguishing equipment immediately available and know how to use it
- Know how to activate the fire alarm and contact the fire department
- Have no other duties that would prevent effective monitoring
- Be trained in the use of fire extinguishers

4.0 Hot Work Permit System

A Hot Work Permit must be issued before any hot work is performed outside of designated hot work areas. The permit system includes the following requirements:

4.1 Permit Issuance

- Permits are valid for one shift only (maximum 12 hours) and must be renewed for continued work.
- A new permit is required any time the work location changes.
- The PAI must physically inspect the hot work area and surrounding spaces (including floors above and below, and adjacent rooms) before issuing the permit.
- The completed permit must be posted at the hot work location for the duration of the work.

4.2 Pre-Hot Work Checklist

The PAI must verify the following before issuing a permit:

- Fire detection/sprinkler systems are operational (or alternative protection provided if impaired)
- Combustible materials within 35 feet have been relocated or protected with fire-resistant covers/shields
- Flammable liquids and gases are removed from the area or properly secured
- Floor and wall openings within 35 feet are covered to prevent spark passage
- Atmospheric testing has been conducted if flammable gases/vapors may be present (results must be below 10% LEL)
- Fire extinguisher(s) appropriate for the hazard are immediately available at the work area
- Fire watch personnel are assigned and briefed

4.3 Permit Completion

Upon completion of hot work, the fire watch must remain on duty for a minimum of 30 minutes. The PAI or fire watch must conduct a final inspection of the area. The completed permit must be returned to the site safety office for recordkeeping.

5.0 Designated Hot Work Areas

Designated hot work areas are permanent locations specifically set up and maintained for hot work. A hot work permit is NOT required for work performed in these areas, provided they meet all of the following criteria:

- Floors are non-combustible (concrete, metal, or equivalent)
- Walls and ceilings are non-combustible construction
- No combustible materials are stored within 35 feet
- Adequate ventilation is provided

- Fire extinguishing equipment is readily accessible
- The area is clearly marked as a "Designated Hot Work Area"
- The area is inspected regularly and kept free of combustible accumulations

6.0 Prohibited Areas

Hot work is strictly prohibited in the following areas:

- Areas with explosive or flammable atmospheres (above 10% LEL)
- In or adjacent to areas storing large quantities of flammable or explosive materials
- On or inside containers that have held flammable substances, unless properly cleaned, purged, and tested
- Areas with dust accumulations that could create an explosive atmosphere
- Near sprinkler system risers, fire suppression system components, or fire alarm equipment (unless coordination with the fire alarm monitoring company is completed)
- Any area where the PAI determines conditions are unsafe

7.0 Fire Watch Requirements

A fire watch is required in all of the following situations:

- Hot work is performed in locations where other than a minor fire might develop
- Combustible material in building construction or contents is within 35 feet of the hot work operation and cannot be removed
- Wall or floor openings within 35 feet expose combustible material in adjacent areas
- Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs

7.1 Fire Watch Duration

The fire watch must continue for a minimum of 30 minutes after hot work operations are completed. If conditions warrant (large amounts of combustible material, confined spaces, or adverse conditions), the fire watch period should be extended to 60 minutes or longer as determined by the PAI.

7.2 Fire Watch Qualifications

Fire watch personnel must be trained in the use of fire-extinguishing equipment, familiar with the facility's emergency alarm procedures, and able to identify fire hazards. Fire watch individuals must have no other assigned duties during the fire watch period that would distract from their monitoring responsibilities.

8.0 Fire Prevention Measures

The following fire prevention measures must be implemented for all hot work operations:

- **Combustible Material Control:** Remove all combustible and flammable materials within 35 feet of the hot work operation. Where removal is not practical, protect materials with fire-resistant covers, curtains, or shields.
- **Floor Protection:** Sweep floors clean of combustible debris. If floors are combustible, wet them down or cover with fire-resistant material.
- **Opening Protection:** Seal or cover all openings in floors, walls, and ducts within 35 feet to prevent sparks from traveling to other areas.
- **Fire Suppression Equipment:** A minimum of one portable fire extinguisher (minimum 2A:10BC rating) must be within immediate reach at the work area. For large-scale operations, additional extinguishers, fire hoses, or standpipes may be required.
- **Sprinkler Systems:** Do not impair fire sprinkler systems or automatic fire detection systems for hot work. If impairment is necessary, notify the fire alarm monitoring service and implement alternative protective measures.
- **Ventilation:** Ensure adequate ventilation to prevent the accumulation of flammable vapors and to maintain safe atmospheric conditions.
- **Atmospheric Monitoring:** Conduct atmospheric testing before and during hot work in areas where flammable gases, vapors, or dust may be present. Work must stop immediately if readings exceed 10% LEL.

9.0 Contractor Requirements

All contractors performing hot work on [Company Name] premises or jobsites must:

- Comply with all requirements of this Hot Work Permit Program
- Obtain a hot work permit from the designated PAI before beginning any hot work
- Provide proof that their employees have completed hot work safety training
- Provide their own fire-extinguishing equipment, unless otherwise arranged
- Designate their own fire watch personnel who meet the qualifications in Section 7.2
- Immediately stop work and notify the PAI if unsafe conditions are observed
- Submit completed hot work permits to the site safety office at the end of each shift

10.0 Training Requirements

All personnel involved in hot work operations must receive training on this program. Training must be provided:

- Upon initial assignment to hot work duties
- Annually thereafter

- When changes are made to this program
- When observations indicate that retraining is needed

Training must cover the following topics:

- Fire hazards associated with hot work operations
- The hot work permit system and procedures
- Fire prevention measures and combustible material control
- Fire watch duties and responsibilities
- Proper use of fire extinguishers
- Emergency procedures and alarm activation
- Atmospheric monitoring and testing procedures

11.0 Recordkeeping

The following records must be maintained:

- Completed hot work permits — retained for a minimum of 1 year (or per company/project requirements)
- Hot work training records for all employees and contractors
- Documentation of designated hot work areas and their inspections
- Any incident reports related to hot work operations

HOT WORK PERMIT

[Company Name] — Per 29 CFR 1910.252 / NFPA 51B

Permit #:		Date:	
Start Time:		End Time:	

Location / Area:	
Building / Floor:	
Work Description:	
Type of Hot Work:	☐ Welding ☐ Cutting ☐ Brazing ☐ Grinding ☐ Soldering ☐ Other: _____

FIRE PREVENTION CHECKLIST — Verify BEFORE Issuing Permit

☐	Sprinklers in service / operable? If impaired, notify fire alarm service.
☐	Combustibles removed or protected within 35 feet
☐	Flammable liquids/gases removed or properly secured
☐	Floor/wall openings covered within 35 feet
☐	Fire-resistant covers/shields in place over immovable combustibles
☐	Fire extinguisher(s) available at work area (min. 2A:10BC)
☐	Fire watch assigned and briefed
☐	Floors swept clean of combustible debris

ATMOSPHERIC TESTING (If Required)

LEL Reading:	_____ %	O ₂ Reading:	_____ %
Instrument:		Calibration Date:	

PERSONNEL

Hot Work Operator:	
Fire Watch Name:	
Fire Extinguisher Location:	

AUTHORIZATION

Issued By (PAI):	Signature:	Date/Time:
Operator:	Signature:	Date/Time:
Fire Watch:	Signature:	Date/Time:

POST-WORK FIRE WATCH COMPLETION

Fire Watch End Time:	(minimum 30 minutes after hot work completion)
Area Inspected By:	
Signature:	
Conditions Satisfactory?	☐ Yes ☐ No — If No, describe: _____

FORBES SAFETY SOLUTIONS

Welding, Cutting & Brazing Safety Program

Enhanced Hot Work Safety

Prepared for:
[COMPANY NAME]

Regulatory References:
29 CFR 1926.350-354 | 29 CFR 1910.251-255 | ANSI Z49.1

Effective Date: [DATE]
Review Date: [ANNUAL REVIEW DATE]

Table of Contents

1. Purpose and Scope

This Welding, Cutting & Brazing Safety Program establishes the requirements for safe performance of hot work operations at [COMPANY NAME] worksites. This program applies to all employees, contractors, and subcontractors who perform or supervise welding, cutting, brazing, soldering, or other hot work operations.

This program covers gas welding and cutting (oxy-fuel), shielded metal arc welding (SMAW), gas metal arc welding (GMAW/MIG), gas tungsten arc welding (GTAW/TIG), flux-cored arc welding (FCAW), plasma arc cutting, and brazing/soldering operations.

2. Regulatory References

- 29 CFR 1926.350 — Gas Welding and Cutting
- 29 CFR 1926.351 — Arc Welding and Cutting
- 29 CFR 1926.352 — Fire Prevention
- 29 CFR 1926.353 — Ventilation and Protection in Welding, Cutting, and Heating
- 29 CFR 1926.354 — Welding, Cutting, and Heating in Way of Preservative Coatings
- 29 CFR 1910.251-255 — Welding, Cutting, and Brazing (General Industry)
- ANSI Z49.1 — Safety in Welding, Cutting, and Allied Processes
- NFPA 51B — Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- AWS D1.1 — Structural Welding Code

3. Roles and Responsibilities

3.1 Management / Program Administrator

- Establish and maintain this written hot work/welding safety program
- Ensure adequate training and resources
- Designate authorized hot work permit issuers
- Ensure fire protection equipment is available and maintained

3.2 Hot Work Permit Issuer / Supervisor

- Inspect and authorize hot work areas before issuing permits
- Ensure fire prevention measures are implemented
- Assign fire watch personnel when required
- Cancel permits when conditions become unsafe

3.3 Welders / Hot Work Operators

- Obtain a hot work permit before beginning any hot work outside designated welding areas
- Inspect equipment before each use
- Maintain safe work practices and use required PPE

- Stop work when unsafe conditions are observed
- Maintain qualification/certification as required

3.4 Fire Watch

- Maintain fire watch during and for at least 30 minutes after hot work completion
- Have firefighting equipment readily available and know how to use it
- Watch for fires in all exposed areas and attempt to extinguish only within capability
- Activate the fire alarm and notify the fire department if unable to extinguish
- Maintain a clear view of the hot work area at all times

4. Hot Work Permit Requirements

A written hot work permit is required for all welding, cutting, brazing, and related operations performed outside of designated welding areas. The permit shall be issued by an authorized person and shall verify:

1. The work area has been inspected for fire hazards
2. Combustible materials within 35 feet have been removed or protected
3. Openings in floors, walls, and ceilings within 35 feet are covered or protected
4. Fire extinguishing equipment is immediately available
5. A fire watch has been assigned (when required)
6. Confined space entry procedures are followed (if applicable)
7. Affected personnel have been notified

The permit shall be posted at the hot work location and retained for at least one year after completion. See Appendix A for the Hot Work Permit Form.

5. Fire Prevention and Fire Watch

5.1 Fire Prevention Requirements

- Remove all combustible materials within 35 feet of hot work, or protect with fire-resistant covers/shields
- Protect combustible floors with fire-resistant material or wet them down
- Seal wall/floor/ceiling openings within 35 feet to prevent spark travel
- Move combustible materials on the other side of walls/partitions if possible
- A fire extinguisher (minimum 20-lb ABC) shall be within immediate reach
- Ensure sprinkler systems are operable; notify fire department if impaired

5.2 Fire Watch Requirements

A fire watch is required when:

- Combustible materials cannot be moved at least 35 feet from the hot work
- Combustible materials are closer than 35 feet and are only protected by covers/guards
- Wall or floor openings within 35 feet expose combustible materials
- Combustible materials adjacent to the opposite side of partitions, walls, ceilings, or roofs

The fire watch shall continue for a minimum of 30 minutes after hot work is completed. Additional monitoring may be required — up to 4 hours for certain conditions per facility policy.

6. Gas Welding and Cutting (Oxy-Fuel)

6.1 Cylinder Storage and Handling

- Store oxygen cylinders at least 20 feet from fuel gas cylinders or separated by a 5-foot high, ½-hour fire-rated barrier
- Secure all cylinders in upright position with chains, straps, or in approved racks
- Keep valve protection caps in place when cylinders are not in use or being moved
- Never lift cylinders by the valve cap or use slings/magnets
- Never use oil, grease, or other lubricants on oxygen fittings or regulators
- Mark empty cylinders "MT" or "EMPTY" and store separately from full cylinders

6.2 Acetylene Safety

- Never exceed 15 psig working pressure for acetylene
- Never use acetylene in a free state at pressures above 15 psig
- Open acetylene cylinder valve no more than 1½ turns; leave wrench in place
- If an acetylene cylinder has been stored on its side, stand upright for at least 2 hours before use
- Never use copper fittings or tubing with acetylene (explosion hazard)

6.3 Flashback Arrestors

Flashback arrestors shall be installed on both the oxygen and fuel gas lines at the regulator connection points. Check valves alone are not sufficient. Flashback arrestors shall be inspected regularly and replaced per manufacturer recommendations.

6.4 Hose and Equipment Inspection

- Inspect hoses before each use for cracks, burns, leaks, or worn fittings
- Replace damaged hoses immediately — do not repair with tape
- Use only approved connectors; never use wire for hose connections
- Purge each hose individually before lighting the torch
- When work is complete, close cylinder valves, bleed lines, and release regulators

7. Arc Welding Safety

7.1 Electrical Hazards

- Only qualified persons shall install, operate, or maintain arc welding equipment
- All arc welding equipment shall be properly grounded
- Inspect cables, connectors, electrode holders, and ground clamps before each use
- Replace damaged insulation and cables immediately
- Never coil or wrap welding cable around the body
- Keep welding cables dry and away from heat, sharp edges, and moving equipment
- Use GFCI protection when welding in damp or wet conditions

7.2 Cable and Connection Requirements

- Use only cables of adequate capacity for the welding current
- Secure the ground clamp as close to the work as practical
- Do not use structural steel, piping, or conduit as a ground return path
- Protect cables from traffic; do not run over cables with vehicles or equipment

7.3 Equipment Shutdown

When arc welding equipment is left unattended, the welder shall disconnect the input power or open the power source disconnect switch. Electrode holders shall be placed to prevent accidental contact.

8. Ventilation Requirements

8.1 General Ventilation

Adequate ventilation shall be provided for all welding, cutting, and brazing operations. Natural ventilation is adequate when:

- The space has at least 10,000 cubic feet per welder
- Ceiling height is at least 16 feet
- Welding is not done in a confined area
- Space does not contain partitions, balconies, or structural barriers that impede airflow

8.2 Mechanical Ventilation

Mechanical ventilation shall be provided when natural ventilation is inadequate. Local exhaust ventilation (LEV) shall provide a minimum air velocity of 100 feet per minute at the welding point. General mechanical ventilation shall provide a minimum of 2,000 CFM per welder.

8.3 Special Ventilation Situations

Additional ventilation or respiratory protection is required when welding:

- Galvanized metal (zinc oxide fumes) — may cause metal fume fever

- Stainless steel — hexavalent chromium (Cr6+) exposure; PEL 5 µg/m³
- Cadmium-plated or coated materials — extremely toxic
- Lead-painted surfaces — lead exposure controls required
- Beryllium alloys — extremely toxic, carcinogen
- In confined spaces — continuous monitoring and ventilation required

9. Special Precautions

9.1 Confined Space Welding

Welding in confined spaces requires compliance with both the Confined Space Entry Program and this Welding Safety Program:

- A confined space entry permit AND a hot work permit are both required
- Continuous atmospheric monitoring for O₂, LEL, and toxic gases
- Continuous mechanical ventilation — never use oxygen for ventilation
- Remove all cylinders and torches when not in use; close valves when leaving
- Gas cylinders and welding machines shall remain outside the confined space
- Use only low-voltage (80V or less), low open-circuit voltage welding machines

9.2 Welding on Galvanized Metal

When cutting or welding galvanized metal, zinc oxide fumes are generated which can cause metal fume fever. Controls include: local exhaust ventilation positioned at the source, respiratory protection (minimum half-face with P100 or OV/P100 combination cartridges), and awareness training on symptoms of zinc oxide exposure.

9.3 Welding on Stainless Steel (Hexavalent Chromium)

Welding or cutting stainless steel generates hexavalent chromium (Cr6+), a known carcinogen with a PEL of 5 µg/m³ (29 CFR 1926.1126). Required controls include: local exhaust ventilation, respiratory protection (minimum half-face with P100), exposure monitoring, medical surveillance, and hygiene facilities.

10. Personal Protective Equipment

10.1 General PPE Requirements

- Welding helmet with appropriate filter lens shade (see table below)
- Safety glasses with side shields (worn under the helmet)
- Flame-resistant clothing (FR-rated or leather) — no synthetic fabrics
- Leather welding gloves appropriate for the process
- Leather boots (minimum 6-inch high) or metatarsal guards
- Hearing protection when noise levels exceed 85 dBA
- Respiratory protection as determined by exposure assessment

10.2 Filter Lens Shade Selection Guide

Welding Process	Electrode Size / Current	Minimum Shade	Suggested Shade
SMAW (Stick)	< 3/32" (< 60A)	7	10
SMAW (Stick)	3/32"–5/32" (60–160A)	8	10–12

Welding Process	Electrode Size / Current	Minimum Shade	Suggested Shade
SMAW (Stick)	5/32" - 1/4" (160-250A)	10	12
SMAW (Stick)	> 1/4" (250-550A)	11	12-14
GMAW (MIG)	< 60A	7	10
GMAW (MIG)	60-160A	10	11
GMAW (MIG)	160-250A	10	12
GMAW (MIG)	250-500A	10	14
GTAW (TIG)	< 50A	8	10
GTAW (TIG)	50-150A	8	10-12
GTAW (TIG)	150-500A	10	12-14
FCAW	60-160A	10	11
FCAW	160-250A	10	12
FCAW	250-500A	10	14
Oxy-Fuel Cutting	Light (< 1")	3	4-5
Oxy-Fuel Cutting	Medium (1"-6")	4	5-6
Oxy-Fuel Cutting	Heavy (> 6")	5	6-8
Plasma Arc Cutting	< 300A	8	9-12
Plasma Arc Cutting	300-400A	9	12-14
Oxy-Fuel Welding	Light	4	5-6
Oxy-Fuel Welding	Medium	5	6-8
Oxy-Fuel Welding	Heavy	6	8

Note: Auto-darkening helmets shall be tested before each use to verify proper shade response. The minimum shade shall not be less than the values in this table.

11. Welder Qualification

Welders performing structural or code-required welds shall maintain current qualifications per applicable codes (AWS D1.1, ASME Section IX, API 1104, etc.). Qualifications shall include:

- Welding procedure specification (WPS) applicable to the work
- Performance qualification tests per the applicable code
- Documentation of qualification test results
- Requalification when a welder has not used a specific process for 6 months or more

Qualification records shall be maintained at the worksite and available for review.

12. Training

All employees who perform or supervise hot work shall receive training before initial assignment and annually thereafter, covering:

- This written program and its requirements
- Hot work permit procedures
- Fire prevention and fire watch duties
- Equipment inspection and safe operation
- Hazards of welding fumes and ventilation requirements
- PPE selection and use
- Emergency procedures and fire extinguisher use
- Special precautions (confined space welding, galvanized/stainless steel)

Fire watch personnel shall receive specific training on their duties before serving in that capacity.

13. Recordkeeping

- Hot work permits: retained for at least 1 year
- Training records: maintained for duration of employment
- Welder qualifications: maintained current and on-site
- Equipment inspection records: maintained for 3 years
- Welding fume exposure monitoring results: maintained per 29 CFR 1910.1020 (30 years)
- Incident/fire reports: retained for 5 years

Appendix A: Hot Work Permit Form

Complete before beginning any hot work outside designated welding areas.

Permit Number:	
Date:	
Work Location:	
Type of Hot Work:	
Work Description:	
Permit Issuer:	
Hot Work Operator:	
Start Time:	
Estimated Completion Time:	

Pre-Work Fire Prevention Checklist

Item	Y/N/NA
Combustibles removed or protected within 35 feet?	
Floors swept clean of combustible debris?	
Combustible floors protected (wet down or fire-resistant covers)?	
Wall/floor/ceiling openings within 35 feet covered?	
Combustible materials on opposite side of walls/partitions protected?	
Fire extinguisher (min 20-lb ABC) immediately available?	
Sprinkler system operational?	
Fire watch assigned (where required)?	
Confined space permit obtained (if applicable)?	
Hot work area ventilated adequately?	
Smoke/fire detection systems operational or bypassed with notification?	
Affected personnel notified?	
Flammable liquids/gases secured or removed?	

Fire Watch

Fire watch name: _____ Start time: _____

Fire watch duration after completion: ☐ 30 min ☐ 60 min ☐ Other: _____

Fire watch completed: ☐ Yes Time: _____ Signature: _____

Authorization

I have inspected the work area and verified all fire prevention measures are in place.

Permit Issuer Signature: _____ Date/Time: _____

Hot Work Operator Signature: _____ Date/Time: _____

Permit Closure

Work area inspected after fire watch period — no fire hazards observed: ☐ Yes

Permit closed by: _____ Date/Time: _____

Appendix B: Welding Equipment Daily Inspection Checklist

Complete at the start of each shift or before first use.

Date:	
Inspector:	
Equipment Type:	
Equipment ID/Serial:	
Location:	
Manufacturer/Model:	

Arc Welding Equipment

Inspection Item	Pass	Fail	N/A	Comments
Power source: housing intact, no damage				
Power cord/plug: no damage, proper grounding				
Welding cables: insulation intact, no bare spots				
Electrode holder: insulation intact, jaws functional				
Ground clamp: functional, clean contact surfaces				
Cable connections: tight, no corrosion				
Cooling system (if applicable): operational, no leaks				
Wire feeder (if applicable): operational				
GFCI protection available (for wet/damp conditions)				

Oxy-Fuel Equipment

Inspection Item	Pass	Fail	N/A	Comments
Cylinders secured upright				
Cylinder valves: no damage, no leaks				
Valve protection caps: available for storage				
Regulators: gauges functional, no damage				
Flashback arrestors: installed on both				

FORBES SAFETY SOLUTIONS

Inspection Item	Pass	Fail	N/A	Comments
lines				
Hoses: no cracks, burns, or worn spots				
Hose connections: tight, proper fittings				
Torch: cutting tip clean, valves functional				
Leak test completed (soapy water)				
O ₂ and fuel gas stored 20 ft apart or barrier in place				

Deficiencies noted — equipment removed from service: ☐ Yes ☐ No

Corrective action: _____

Inspector Signature: _____ Supervisor Review: _____

Fire Prevention on the Jobsite

Ref: 29 CFR 1926.150–155 — Fire Protection and Prevention

[Company Name]

[Date]

TOOLBOX TALK

WHY THIS MATTERS

4,000+

Structure fires at construction sites reported annually in the United States

\$300M+

Annual property damage from fires on construction and renovation sites

37%

Of construction fires are caused by hot work operations (cutting, welding, brazing)

Common Fire Causes on Construction Sites

IGNITION SOURCES

- Hot work: welding, cutting, brazing, soldering — sparks can travel 35+ feet
- Electrical faults: overloaded circuits, damaged cords, temporary wiring
- Temporary heating devices placed too close to combustibles
- Smoking in unauthorized areas
- Improperly discarded rags soaked with solvents or oils

FUEL SOURCES & CONDITIONS

- Flammable liquids: gasoline, solvents, adhesives, paints stored improperly
- Combustible construction materials: lumber, insulation, packaging
- Accumulated trash, sawdust, and debris on site
- Compressed gas cylinders stored near heat sources
- Poor housekeeping is the #1 contributing factor to fire spread

Fire Extinguisher Use & Response

P.A.S.S. TECHNIQUE

- P — PULL the pin to unlock the extinguisher
- A — AIM the nozzle at the base of the fire, not the flames
- S — SQUEEZE the handle to release the extinguishing agent
- S — SWEEP side to side at the base until the fire is out
- Stand 6-8 feet from the fire; back away facing the fire area

FIGHT OR EVACUATE?

- ONLY fight a fire if: it is small (trash can size), you have a clear escape route, the extinguisher is rated for the fire type, and you are trained
- EVACUATE if: fire is spreading, room fills with smoke, you are unsure, or extinguisher is empty/ineffective
- Always alert others and call 911 before attempting to fight
- Know your site evacuation routes and assembly points

Hot Work Permit & Housekeeping Requirements

Requirement	Standard	Key Details
Hot Work Permit	Required	Written permit for all welding, cutting, brazing operations
Fire Watch	30 min minimum	Trained person monitors area during and 30 min after hot work
Extinguisher distance	Within 25 ft	Fully charged, correct type extinguisher within travel distance
Flammable storage	Approved cabinets	Max 25 gallons per cabinet; away from ignition sources
Combustible clearance	35 ft radius	Remove or cover combustibles within 35 ft of hot work
Daily cleanup	End of shift	Remove trash, oily rags, and debris daily; rags in metal containers with lids

QUIZ / DISCUSSION

1

What does P.A.S.S. stand for when using a fire extinguisher?

Answer: Pull the pin, Aim at the base of the fire, Squeeze the handle, Sweep side to side.

2

How long must a fire watch be maintained after hot work is completed?

Answer: A minimum of 30 minutes after hot work operations have ended to ensure no smoldering material remains.

3

Name two conditions where you should evacuate rather than fight a fire.

Answer: Any two of: the fire is spreading rapidly, the room is filling with smoke, you don't have a clear escape route, the extinguisher is empty or ineffective, or you are untrained.

ATTENDANCE SIGN-OFF

Fire Prevention on the Jobsite

#	Print Name	Signature	Company	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

By signing above, I confirm that I attended this toolbox talk and understand the material presented.