DEPARTMENT OF FIRE SERVICES
Division of Fire Safety

Hot Works
In March 2014, two Boston firefighters died responding to a fire that was started by hot work. As a result of that tragedy, many people, associations and agencies have been working with various fire departments since September to deliver hot work safety training to construction workers in Massachusetts and New England, these are some of the major misconceptions surrounding hot work.

NFPA 51B

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
(Based on the 2015 of NFPA 1)
Agenda

Hot work
PAI
Permits
  • AHJ vs. Hot-works
  • Limited exemption
Qualified Person

Permissible Areas
  • Designated area
  • Permit Required Area

Education provisions
  • Limited exemption
Key Documents for Safe Hot Work Operations

Massachusetts Comprehensive Fire Safety Code
527 CMR 1.00 - Chapter 41


ANSI Z49.1 Safety in Welding, Cutting and Allied Processes, 2012 edition, American Welding Society

OSHA 29CFR Subpart Q - Welding, Cutting and Brazing, 1910.251-1910.255
NFPA 51B

• Hot Work Fire Safety Practices

• Purpose
  – Provide guidance to those who manage, supervise, and perform hot work
  – Includes property managers and contractors
3-Step Approach to Hot Work Safety: [R.E.C.]

• **Recognition**—hazard identification
  – Determine type of hot work
  – Determine fuel sources

• **Evaluation**—assess degree of hazards
  – Visual inspection of hot work location

• **Control**—minimize or eliminate hazards
  – Safety Team and Permit, ventilation, isolation of fuel and ignition sources, training, PPE
RECOGNITION - What is Hot Work?

Activities involving:

• Flame
• Spark production
• Heat
NFPA 51B Scope

✓ Welding
✓ Cutting
✓ Grinding
✓ Soldering
✓ Heat Treating
✓ Hot riveting

✓ Powder-driven fasteners
✓ Abrasive blasting
✓ Torch-applied roofing (see NFPA 241)
✓ Similar applications that produce or use spark, flame or heat
Hot Work *Does Not* include:

- Candles (Chap. 10)
- Cooking operations (Chap. 50)
- Electric soldering irons
- Pyrotechnics (Chap. 65)
RECOGNITION
Fuel Sources

✓ Flammable or combustible liquids
✓ Combustible dusts
✓ Fuels and lubricants
✓ Paints or coatings
✓ Cleaning solvents
✓ Common combustibles - paper, rags
✓ Improperly cleaned containers
EVALUATE AND CONTROL
Hot Work Safety Team

✓ Team includes Permit Authorizing Individual (PAI), hot work operator
✓ All responsible for safety during hot work
Permit Authorizing Individual (PAI)

“An individual designated by management to authorize hot work.” (41.1.1.1 (7))
Permit Authorizing Individual’s (PAI) Duties

✓ Trained in health and safety issues regarding hot work

✓ Is familiar with types of hot work

✓ Ensures that combustibles are moved or protected
Permit Authorizing Individual’s (PAI) Duties - continued

- Confirms fire watch is present

- Final check-up if no fire watch

- Issues Hot works permits
  - Not a permit from the Fire Department (AHJ)
Permit Authorizing Individual’s (PAI) Duties - continued

✓ Considers alternatives to hot work
  ✓ Screwed, flanged or clamped pipe, manual hydraulic shears, etc.

✓ Considers operator PPE

✓ Radiation, lead, noise
Hot Work Operator’s Duties

- Only jobs familiar with & trained for
- Start AFTER permit complete & posted
- Reviews Permit
  - Understands instructions and controls
- Feels comfortable stopping work
Fire Watch

“The fire watch shall be trained to understand the inherent hazards of the work site and of the hot work.” (41.2.4.1)
Fire Watch

✓ Might not be required
✓ Located close to site & more than one if area not fully visible
✓ Detect fires and sound alarm
✓ Changing conditions?
✓ Remain for at least 30 minutes after completion of hot works operations
“When do I need a Fire Watch?”

✓ Fire Watch Decision Tree-
✓ Assists in assessing conditions
✓ Leads to making decision on need for and number of fire watches
✓ Placement determined through actual site assessment
Fire Watch’s Duties

✔ Ensures permit complete and posted
✔ Reviews permit
✔ Understands instructions and controls
✔ Monitor for smoldering or fires
✔ Shall meet same hot works training requirements as PAI, management, etc.
Fire Watch’s Duties

- Keeps passersby at distance
- Ensures conditions don’t change
- Feels comfortable stopping work
Area Definitions

✓ Permissible Areas
  ✓ Designated Area
  ✓ Permit-Required Area
✓ Non-permissible Areas
Permit Required Area
Permit Required Area

- 35 Foot rule
- Fire Watch
Sphere of Influence: 35-Foot Rule

✓ Combustibles 35-feet from work
  ✓ Moved or protected
✓ Origin of provision
✓ Horizontal versus vertical distance
✓ Subtle passages, openings, moving equipment or machinery
✓ May be increased or decreased by PAI
Permit Required Area

Confined Areas
Designated Areas

- No permit needed
  - Initial permit required
- Meets permit requirements
  - Example: Maintenance shops
- Review annually
  - Most common area for welding fires!
  - Good practice to periodically re-check
Non-permissible Areas

✓ Not permitted under ANY circumstances
✓ Not authorized by management
✓ Sprinklers impaired
✓ Explosive atmospheres
  ✓ In air
  ✓ In container
  ✓ Dust accumulation
Purpose of Hot Works Permit

✓ Forces completion and documentation of recognition, evaluation and controls
  ✓ Separates unintentional fuel from ignition
✓ Posted permit is notice to all of possible hazards
✓ Raise awareness of changing conditions
✓ 2014 edition 51B, : MAXIMUM PERIOD 24 HOURS
Hot Works Permit Minimum Contents

- Every permit different
- Work location
- Type of hot work
- Work to be done and by whom
- Duration
- Controls to ensure safety
- Includes equipment

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**HOT WORK PERMIT**

Seek an alternative/safer method if possible!

Before initiating hot work, ensure precautions are in place as required by NFPA 51B and ANSI Z89.1.

Make sure an appropriate fire extinguisher is readily available.

This Hot Work Permit is required for any operation involving open flame or producing heat and/or sparks. This work includes, but is not limited to, welding, brazing, cutting, grinding, soldering, sharpening pipe, torch-applied roofing, or chemical/thermal process.

**DATE**

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**LOCATION/Building and floor**

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**WORK TO BE DONE**

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**TIME STARTED**

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**TIME COMPLETED**

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**HOT WORK PERMIT**

- I verify that the above location has been examined, the precautions marked on the checklist below have been taken, and permission is granted for this work.

**COMMENTS**

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**Signature**

**Date**

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**Requirements within 35 ft. (11 m) of hot work**

- Flammable liquid, dust, lint, and oily deposits removed.
- Explosive atmospheres in area eliminated.
- Floors swept clean and trash removed.
- Combustible floors wet down or covered with damp sand or fire-resistive/noncombustible materials or equivalent.
- Protect personnel from external shocks when floors are wet.
- Other combustible storage material removed. Otherwise, cover with approved materials (welding pads, blankets, curtains, fire-resistant vaporization, metal shields, or noncombustible materials).
- All walls and floor openings covered.
- Dusts and vapors that might carry sparks to distant combustible material removed, protected, or shut down.

**Requirements for hot work on walls, ceilings, or roofs**

- Combustible material on other sides of walls, ceilings, or roofs is moved away.
- Combustible material on other sides of walls, ceilings, or roofs is removed.
- Containers are purged of flammable liquid/air.
- Pressurized vessels, piping, and equipment are removed from service, isolated, and vented.

**Requirements for hot work fire watch and fire monitoring**

- Fire watch is provided during and for a minimum of 30 min. after hot work, including any break activity.
- Fire watch is provided with a suitable extinguisher, and where practical, a charged small hose.
- Fire watch is trained in use of equipment and in sounding alarm.
- Fire watch can be required in adjoining areas, above and below.
- Yes, No

- For the P&I/fire watch, monitoring of hot work area has been extended beyond the 30 min.

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Hot Works Training Program

✓ As of July 1, 2018, an individual to be qualified shall complete hot work training containing the following subject matter:

- Massachusetts Comprehensive Fire Safety Code, 527 CMR: 1.00 Chapter 41, Hot Work Operations
- 29 CFR 1910.252 Subpart Q-Welding, cutting and brazing
Fire Department (AHJ) Permit

• A permit from the Head of the Fire department shall be required to be issued by the AHJ additional to the required Hot works permit as a preconditioning to performing Hot Work. Always check with the AHJ.

• Exemption: Designated areas pre-approved by the Building and Fire Officials.
Fire Department (AHJ)- Exemptions
A permit shall not be required from the fire department when the hot work activity is performed by a person, or under the direct supervision of a person, licensed and permitted pursuant to a specialized code as defined in M.G.L. c. 143, §96.

- However, such individuals must complete the training requirements.
- And comply with the rules prescribed for hot work
  - Clear the area
  - 35-foot rule
  - Combustible walls/floors shall be kept wet, cover open cracks (within 35 ft. rule) protect walls, ceiling and floors with curtains, mats, blankets, etc.
  - Education and permits governed by the licensing authority for that particular Board.
Fire Department (AHJ)- permit Exemption

Exception: Homeowners and Hobbyists

✓ No training requirements
✓ No permit requirements
Hot Works Training - Exemption

- Any licensed person or person under the direct supervision of a person licensed performing hot work are required to completed training for hot works safety either:
  - (a) by obtaining training approved by the authority issuing them a license to perform specialized code work; or
  - (b) by meeting the requirements of 41.7 of Chapter 41.
Fire Department (AHJ)- permit Exemption

- Individuals who conduct hot work operations on their premise or equipment shall be permitted to carry-out hot work, after consultation with the AHJ before hot work operations can be conducted. Further, such person shall meet the training provisions, pursuant to 41.7 of Chapter 41.
  - However, such individuals must complete the training requirements.
  - And comply with the rules prescribed for hot work.
Hot Works Training Certificate

- Wallet size preferred
Information Sources

• Compliance Desk - DFS
  – (978) 567-3375
  – https://www.mass.gov/orgs/department-of-fire-services

American Welding Society
  – (800) 443-9353
  – www.aws.org

OSHA
  – (800) 321-OSHA
  – www.osha.gov
Approved Hot Works
Training Programs

National Fire Protection Association
  - Classroom / On-line
  - www.nfpa.org

Gould Construction Institute
  - Classroom
  - www.gwgci.org

Colden Corporation
  - Classroom
  - www.colden.com

Tiger Training Corporation
  - Classroom
  - www.tigertrainingcorp.com
Questions?
In closing: Please note this does not exempt anyone from the required training as covered by this code!
Thank You