



# **Products**

## **Hot Work Standard**

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**Version 1.1**

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## Introduction

Hot Work requirements are designed to help prevent injuries to personnel, property damage or adverse environmental impact due to fire or explosion. Hot Work is considered to be any process or work that has a potential to start fires or cause an explosion due to the production of flames, heat and/or sparks in the presence of flammable or combustible materials / vapors.

This standard defines the **Products** requirements for Hot Work.

The following sections provide minimum requirements for hot work as well as supporting guidance to clarify the intent of those requirements. Requirements of this Standard shall be met.

This standard does not cover cutting or welding on tanks, vessels or piping (hot tapping) connected to the tank or vessel while in service. These are high risk activities that require additional safeguards and management approval.

## Requirements

1. Cold work or other alternatives shall be considered before undertaking hot work. These alternatives include, but are not limited to:
  - a. Use of hand or pneumatic tools that have a low probability of creating enough energy to ignite a flammable mixture.
  - b. Movement of the material outside of classified areas.
  - c. Mechanical bolting or other non-hot work alternatives
  - d. Delaying work until next scheduled turnaround or shutdown
2. Hot work shall not be allowed in the presence of explosive atmospheres.
  - a. Opening Piping & Equipment that may contain flammable materials shall not be done using Open Flame or Non-Open Flame Hot Work techniques unless it has been verified to be free of flammable materials prior to opening.
  - b. There shall be no hot work performed within 50 ft (15m) of Opening Piping & Equipment that may contain flammable materials unless:
    - i. The piping or equipment has been verified to be free of flammable materials prior to opening or
    - ii. All Hot Work within 50 ft (15m) is shut down until the piping or equipment is verified to be free of flammable materials.
3. Hazardous (Classified) Locations and Safe Hot Work Areas must be designated and approved by management.
4. A Hot Work Permit shall be permitted in accordance with the Products Permit to Work Standard, including but not limited to: See Table 1. Mandatory Requirements
  - a. Open flame hot work inside a hazardous (Classified) location shall require a hot work permit.
  - b. Non-open flame hot work inside a hazardous (classified) location shall be permitted in accordance with risk as determined by the site.

- c. The use of handheld, battery-operated devices shall be permitted in accordance with risk as determined by the site.
- 5. A Hot Work Permit shall not be required for Open Flame Hot Work inside a designated Safe Hot Work Area.
  - a. Designated Safe Hot Work Areas are typically maintenance shops but must be outside of hazardous (classified) areas.
  - b. While hot work permits are not required in Designated Safe Hot Work Areas, all hot work conducted in such areas must be conducted in accordance with a site maintenance procedure / JLA with appropriate controls for identified hazards.
  - c. Designated Safe Hot Work Areas shall be clearly identified by signage – Posting of an annual permit for the Designated Safe Hot Work Area is an acceptable means of meeting this requirement
  - d. Designated Safe Hot Work Areas shall be approved by BU management in consultation with health & safety /fire subject matter experts.
  - e. Designated Safe Hot Work Areas shall be made of non-combustible or fire-resistant construction or adequately guarded/protected.
  - f. Designated Safe Hot Work Areas shall be maintained free of flammable and combustible materials or such materials shall be adequately guarded/protected.
  - g. Designated Safe Hot Work Areas shall be reassessed at least annually or when conditions change to ensure that these required conditions are maintained. Assessments shall be conducted more frequently to address higher risk locations.
  - h. Operations/Supply Chain Manager approval must be obtained for all annual Hot Work permits in accordance with the Hazard Analysis standard and the Task Consequence Catalogue.
- 6. The requirements for a Hot Work Permit outside a Hazardous (Classified) Location and outside a designated Safe Hot Work Area are defined in Table 1. Mandatory Requirements.
- 7. Hot work includes but is not limited to the work defined in Table 2. Hot Work Classification.
  - a. There are three classifications of Hot Work – Open Flame, Non-Open Flame and Handheld Battery-operated Devices.
  - b. Specific requirements for vehicle entry and handheld battery-operated electronic devices are outlined in section 15 and 16 below.
- 8. Hot Work Permits shall be used in accordance with the Products Permit to Work Standard.
  - a. Revalidation, shift handover and work completion for hot work tasks must conform with the Products Permit to Work Standard
- 9. A hazard analysis shall be performed in accordance with the Products Hazard Analysis Standard when planning work involving Hot Work.
- 10. A Job Safety Analysis (JSA) shall be conducted at the work site in accordance with the Products Hazard Analysis Standard prior to work involving Hot Work.
  - a. To identify significant potential hazards.
  - b. To identify the need for safeguards such as gas testing.
  - c. To identify if work will require permits (e.g., Permit to Work, Isolation of Hazardous Energy, Confined Space & Excavation).

- d. To assess the need for or evaluation of Simultaneous Operations (SimOps).
  - e. To identify and evaluate precautions to ensure that work may be conducted safely.
- 11. Hot Work shall be stopped / suspended and all ignition sources eliminated in but not limited to the following circumstances:
  - a. Change in job site conditions that may create a potentially unsafe condition
  - b. Gas monitoring indicates concentrations outside of the accepted values.
  - c. The Facility emergency alarm is sounded excluding planned or routine testing.
  - d. The Permit Issuer withdraws the permit
  - e. A required safeguard is no longer present or functional (examples: gas detection failure, fire watch no longer available, etc.)
  - f. Anyone exercises Stop Work Authority
  - g. Change in scope of the work that was not anticipated
  - h. The job site has been unattended for more than **30-minutes**
  - i. The permit expires
- 12. Process Equipment and Job Site Preparation for Hot Work
  - a. Competent personnel shall complete the steps necessary to properly and safely prepare affected equipment for the start of Hot Work. This includes, but is not limited to, applying isolation per the Products Isolation of Hazardous Energy Standard and depressuring, purging, flushing, cleaning, draining and venting equipment as appropriate.
  - b. Flammable and Combustible materials shall be removed or otherwise protected within a 50 foot (15 meter) radius for Open Flame Hot Work.
  - c. Floor openings, holes, ducts or cracks in flooring or walls, open doorways and open or broken windows that cannot be closed or removed and may be exposed to sparks shall be protected within a 50 foot (15 meter) radius.
  - d. Flammable and Combustible materials adjacent to the opposite side of partitions, walls, ceilings, or roofs that are likely to be ignited by conduction, radiation or direct flame contact shall be protected.
  - e. Gas cylinders for hot work shall not be taken into confined spaces. When not in use, gas cylinder valves shall be closed. In the absence of continuous gas monitoring, the torch/leads shall be removed from the confined space.
  - f. Arranging for continuous ventilation during hot work.
  - g. Positioning fire-fighting equipment **that has been inspected and functional**.
  - h. Notifying facility personnel.
  - i. Ensuring there is a designated Fire Watch person at job the site.
  - j. Gas-testing the job site and the surrounding 50 feet (15 meters).
- 13. Gas testing shall be required for Hot Work as defined in Table 1 below.
  - a. Gas testing must conform to the Products Portable Gas Detection Standard.
  - b. Gas testing is required prior to all hot work in classified hazardous areas and prior to Open-Flame hot work in all areas.
  - c. Only a Qualified Gas Tester (QGT) may perform initial, renewal and revalidation gas testing for Permitted work in accordance with the Products Portable Gas Detection Standard. Monitoring of gas detection of equipment can be done by a Competent Gas Monitor (CGM). The frequency of gas testing shall be stated in the Hot Work Permit.
  - d. Initial gas testing shall include testing for oxygen and flammable vapor, and other toxic gases and vapors as identified in the hazard assessment. The results of such a test will be used to determine:

- If the area is safe for hot work
  - If additional vessel purging is necessary
  - Time limitations for hot work to be conducted
- e. Initial and followup gas testing must be performed by a Qualified Gas Tester. Monitoring gas detection equipment can be done by a Competent Gas Monitor.
  - f. Initial testing must be performed after the hot work job site and equipment have been properly isolated and prepared.
  - g. Gas testing for LEL shall be performed in the surrounding area for a distance of 50 feet (15 meters). Hot work must not be performed if LEL is greater than zero percent and/or if residues of combustible liquids are present. The exception is hot tapping for which specific precautions must be taken.
  - h. If gas test results indicate greater than zero percent LEL, the source of the flammable gas or vapor must be identified and actions taken to eliminate it.
  - i. If at any time during the performance of the hot work, subsequent gas testing reveals an LEL of greater than zero percent, then the hot work is to be immediately stopped and the work site shall be re-evaluated. The Hot Work Form may not be revalidated, renewed or reissued until the source of the flammable vapor is determined and eliminated and further gas testing indicates a zero percent LEL.

**NOTE: Reference the Products Portable Gas Detection Standard for Deviation process for LEL that exceeds 0 %, however, hot work is never allowed above 10% LEL.**

- j. The Qualified Gas Tester will determine the frequency of gas testing based on the potential risk, but in no cases shall follow-up gas testing exceed 4 hours, **unless continuous gas testing is in place**, or the work must stop and the Permit(s) must be revalidated. The required frequency of gas testing must be noted on the work permit documents.
  - k. Note: Any hot work performed inside a confined space requires continuous gas testing in the area of the hot work.
  - l. Continuous Gas Testing is required for situations where flammable vapors could be introduced due to changing conditions.
    - i. Hot Work in Confined Spaces
    - ii. Hot Work in Excavations where there is a possibility of the soil being contaminated with hydrocarbons or other potentially flammable substance
    - iii. Any Hot Work in a Classified Area
  - m. See Sections 15 and 16 below for specific gas testing requirements for vehicle entry into Hazardous (Classified) areas and handheld battery-operated devices.
14. Fire watches are required for all open flame hot work in Hazardous (Classified) areas and for open flame hot work in non-Hazardous (Classified) areas when there is a potential for more than a minor fire (incipient stage fire). The following additional requirements also apply:
- a. They must have fire extinguishing equipment readily available and be trained in its use.
  - b. They must be familiar with how to sound an alarm in the event of a fire.

- c. The Fire Watch must remain 30 min. after Open Flame Hot Work has stopped, including breaks, to watch for and extinguish smoldering fires.
- d. More than one fire watch may be required if the hot work activity cannot be observed along with the area potentially exposed to sparks (e.g., elevated locations, adjacent areas divided by walls, etc.)
- e. If welding is to be done on a metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall also be provided.

Table 1. Mandatory Requirements

(✓ indicates mandatory requirement – Notes referenced below) (L) (M)

<b>Mandatory requirements for Open Flame &amp; Non-Open Flame Hot Work.</b> See 15 & 16 below for Vehicle Entry & Handheld Battery Operated Devices	<b>Open Flame Hazardous (Classified) Area</b>	<b>Open Flame Non-Hazardous (Classified) Area</b>	<b>Non-Open Flame Hazardous (Classified) Area</b>	<b>Non-Open Flame Non-Hazardous (Classified) Area</b>
Initial gas test using active pump	✓	Recommended	✓	
Continuous %LEL monitoring	✓	Note 1	✓	Note 1
Identification of the last process contents of process equipment to be worked on.	✓	✓	✓	✓
Identification of the observable combustible residue on process equipment.	✓	✓	✓	✓
Isolated per Products Hazardous Energy Isolation Standard	✓	✓	✓	✓
Non-combustible covers shall be used to contain sparks as close to work as possible.	✓	✓		
Shut down hot work during abnormal process operations/upsets	✓	✓	✓	✓
Shut down hot work during process sampling and opening equipment within 50 feet (15 m)	✓	✓	✓	
Prohibition of any SIMOPS that may conflict with hot work activity	✓	✓	✓	✓
Fire Watch for duration (See section 14)	✓	If required		
Appropriate fire extinguishing equipment maintained at jobsite (extinguishers, hoses, monitors)	✓	✓	✓	
All sewers and drains within 50 feet (15 m) shall be covered with non-combustible covers or other appropriate drain covers	✓	✓		
All openings / gaps into process equipment shall be sealed and sensitive process equipment (gauges, bridles) shall be protected.	✓	✓		
Housekeeping in area to remove or protect all combustible materials (50 feet (15 m))	✓	✓		
Inspection of all hot work equipment (leads, hoses, torches, machines) prior to use each shift.	✓	✓		
Ventilation plans that address exposure potential for welders and support personnel as appropriate. Exhaust ventilation shall be directed away from work crews	✓	✓		

Note 1: Continuous %LEL monitoring is required in all confined spaces and when there is potential for rapidly changing LEL.

15. Vehicle Entry into Hazardous (Classified) Areas - Permits and Hazard Analysis for motorized vehicles (battery or internal combustion engines) moving or operating in a Hazardous (Classified) Area shall include the following mandatory requirements:

- a. Gas test with active pump for %LEL & %O<sub>2</sub>.
- b. Gas testing shall encompass an area of 10 feet (3 meters) around the path of travel where flammable materials have a potential to impact the entry such as sumps, drains, liquid boots, flanges, valves, pump seals, clamps on lines.
- c. Sewers and drains in within 5 feet of the area shall be covered with approved drain covers if a vehicle will be operating in a fixed location.

16. Handheld battery-operated electronic devices

- a. BU must have a process for approving the use of handheld battery-operated devices in Hazardous (Classified) areas to prevent use in hazardous environments. For example, written authorization by area owners via a sign in / sign out process with associated training for the workforce.

NOTE: reference Products Use of Cell Phones and Tablets

17. Hot Tapping activities must conform to API RP 2201 "Procedures for Welding or Hot Tapping on Equipment Containing Flammables" and PIM-EN-600 Piping Guidelines.

18. BUs must also conform to the Critical Consequence Plan Standard for Welding on Equipment in Service, Hot Taps and Line Stops. See Appendix A

19. Personnel assigned responsibilities in hot work roles must be trained and competent

20. The Hot Work Permitting process shall indicate roles, responsibilities and protocols as described in the Products Work Authorization Standard.

- a. Roles & Responsibilities for Products locations are described in the Products COW Process Roles & Responsibilities

21. Training requirements and competency assessments for personnel affected by and authorized in Hot Work shall be documented.

**a. Initial Training**

Personnel must meet the competency requirements prior to starting work. Refer to the Products – COW Training Requirements Tool.

**b. Refresher Training**

Refresher training must be provided as follows:

- Whenever an individual demonstrates insufficient knowledge of the Products Hot Work Standard.
- At least every three years.
- Whenever an incident has occurred where the root cause indicates a lack of knowledge of the work permit process

22. The Hot Work standard shall define the policy for record retention that meets regulatory corporate and operating company requirements (or at least 6 months, whichever is more).

### Retention Requirements

All documents will be retained in accordance with the Chevron's Retention Schedule and as required by local regulations. At a minimum, records will be kept for the periods specified below:

- Copies of all work permits, forms (including hot work) and associated documentation (such as gas testing) will be kept for one year or from audit to audit, whichever is the lesser.
- Training records will be kept for personnel until five years beyond termination of employment.
- Copies of letter of authorization of the Permit Issuer and Approver will be kept on file for three years, as proof of role competency.
- In cases where contractor self-permitting is allowed, the Company representative or the Person in Charge will keep the list of contractors, who are authorized to self-permit, at the job site for one year.
- In cases where an incident occurred at the job site while the permit was in effect, the permit form and related documents must be kept with the incident investigation documentation.

Table 2. Hot Work Classification

<b>Open Flame Hot Work</b>
Air Arcing – Arc gouging
Burning acetylene or other gases / Brazing
Electric resistance heaters – stress relieving / pre-heating
Equipment that generates an exposed flame
Soldering
Thermal Oxidizers
Torch Cutting
Welding, brazing, cutting, grinding or chipping
Welding on equipment in service in preparation for a Hot Tap or Stopple
Any activity with an uncontrolled ignition source
<b>Non-Open Flame Hot Work</b>
Abrasive Blasting
Electric power tools
Hand-held battery operated drills
Hot tapping – (involves welding on (open flame) and then cutting an opening into equipment (non-open flame) that is in service.)
Hydroblasting and other tasks that produce static accumulated charges or sparks
Lap-Top Computers
Man-lifts / scissor lifts
Motorized vehicles (electric, diesel, gasoline powered)
Needle-guns
Portable internal combustion engines (e.g., light towers, compressors, generators)
Radiography



Tools with rotary motors
Welding machines
<b>Handheld Battery Operated Devices</b>
Non-explosion proof cameras, electrical devices, vibration analyzers, inspection equipment, temperature guns and cell phones.

## Document History

### Document Control

Description	Enterprise	Products Specific
Approval Date		<i>July 2024</i>
Next Process Document Review		<i>July 2027</i>
Control Number		<i>Version 1.1</i>

### Document Change History

Changes to this document are listed in the table below by change date.

Date (DD/MM/YY)	Version Number	Description of Change
<i>15 July 2021</i>	<i>1.0</i>	<i>New F&amp;L Standard</i>
<i>1 October 2024</i>	<i>1.1</i>	<i>Revised to reflect Products organization. Standard align with Enterprise &amp; changes in red font</i>

## Appendix A

1. [Welding on Equipment in Service Hot Tap / Line Stop SWC/Essentials Checklist](#)
2. [Critical Consequence Plan \(CCP\) Requirements](#)
3. [Oxy Acetylene Pre-Use Inspection Checklist](#)