

Current OARs	Draft OARs
<p><b>437-002-0282 Job Planning and Layout</b></p> <p>(1) Before operations are started, portable equipment shall be securely blocked to prevent accidental movement.</p> <p>(2) Tanks, boilers, drums and similar containers shall be equipped with ladders for the welders and other workers whenever conditions require their use for safe access and egress.</p> <p>(3) No welding equipment shall be allowed on elevated structures unless such structure is designed and built to support all loads imposed on the structure.</p> <p>(4) Work areas shall be designed, laid-out and operated in a manner to prevent welding hose and cable from creating a tripping hazard.</p> <p>(5) When welding or cutting is being performed in any confined space, the gas cylinders and/or welding machines shall be left on the outside.</p>	<p><b>437-002-0282 Job Planning and Layout</b></p> <p>(1) Before starting operations, securely block portable equipment to prevent accidental movement.</p> <p>(2) Tanks, boilers, drums and similar containers must be equipped with ladders for the welders and other workers whenever conditions require their use for safe access and egress.</p> <p>(3) Do not allow welding equipment on an elevated structure unless the structure is designed and built to support all loads imposed on the structure.</p> <p>(4) Design, layout and operate work areas in a manner that prevents welding hose and cable from creating a tripping hazard.</p> <p>(5) When welding or cutting is being performed in any confined space, the gas cylinders and/or welding machines must be left on the outside.</p>
<p><b>437-002-0283 Eye Protection and Protective Clothing</b></p> <p>(1) Easily ignited, highly flammable clothing, such as is made from synthetic materials, shall not be worn.</p> <p>(2) Flash goggles with side shields (Shade No. 2, Style Nos. 2 or 3) shall be worn under the welding helmet or hand shield.</p> <p>(3) The skin shall be covered completely, by a double layer of clothing or equivalent, to prevent burns or other damage by ultraviolet light.</p>	<p><b>437-002-0283 Additional Protective Clothing Requirements</b></p> <p>(1) Do not allow easily ignited, highly flammable clothing, such as is made from synthetic materials, to be worn by employees performing hot work activities.</p> <p>(2) During hot work, the skin must be covered completely by a double layer of clothing or equivalent to prevent burns or other damage by ultraviolet light.</p>

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<p><b>437-002-0284 Specifications for Protectors</b></p> <p><i>(1) Where the “lift front” welder’s helmet is used, there shall be a stationary safety glass on the inside of the frame next to the eyes to protect welder against flying particles when the front is lifted. Where lens containers will not permit use of such safety glass, safety goggles shall be worn.</i></p> <p><i>(2) Where the “lift front” helmet with three glasses is not used, or the flat type helmet is used, the welders shall wear other spectacle-type safety goggles in addition to the filter lens and cover glass.</i></p>	<p><b>437-002-0284 Additional Specifications for Eye and Face Protection</b></p> <p><i>The employer must provide and require the use of appropriate eye and face protection during all welding, cutting, and grinding tasks.</i></p>
<p><b>437-002-0285 Special Precautions</b></p> <p><i>Before welding or cutting on walls, floors or ceilings, an inspection shall be made to see that no combustible material is present on the hidden side.</i></p>	<p><b>437-002-0285 Additional Special Precautions</b></p> <p><i>Before welding or cutting on walls, floors or ceilings, inspect the hidden side to ensure that no combustible material is present.</i></p>

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<p><b>437-002-0286 Preservative Coatings</b></p> <p><i>(1) Before welding, cutting or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability.</i></p> <p><i>(2) Precautions shall be taken to prevent ignition of highly flammable hardened preservative coatings. When coatings are determined to be highly flammable, they shall be stripped from the area to be heated to prevent ignition.</i></p>	<p><b>437-002-0286 Flammable Preservative Coatings</b></p> <p><i>(1) Before welding, cutting or other hot work is commenced on any surface covered by a preservative coating whose flammability is not known, a competent person must test it to determine if it is highly flammable. (Preservative coatings are highly flammable when scrapings exposed to heat ignite rapidly.)</i></p> <p><i>(2) Preservative coatings that are determined to be highly flammable must be stripped from the area to be heated to prevent ignition.</i></p>
<p><b>437-002-0287 Toxic Preservative Coatings</b></p> <p><i>(1) In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least 4 inches from the area of heat application, or the employees shall be protected by a respirator against hazards from breathing toxic vapors in accordance with occupational health regulations.</i></p> <p><i>(2) The preservative coatings shall be removed a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heated area may be used to limit the size of the area required to be cleaned.</i></p>	<p><b>437-002-0287 Toxic Preservative Coatings</b></p> <p><i>(1) In confined and other enclosed spaces, preservative coatings that are toxic but not highly flammable must be removed a distance of at least 4 inches from the area of heat application.</i></p> <p><i>(2) This distance must be adequate to ensure that the temperature of any remaining unstripped metal will not be raised enough to produce toxic fumes and gases.</i></p> <p><i>(a) You may use artificial cooling of the metal surrounding the heated area to limit the size of the area that is required to be stripped.</i></p> <p><i>(b) As an alternative to stripping these coatings, protect employees with an appropriate respirator in accordance with the Respiratory Protection Standard.</i></p>

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<p><b>437-002-0288 Health Protection and Ventilation – General</b></p> <p>(1) When welding or cutting operations are being performed on the following materials (Table OR Q 1), the protective measures indicated are required unless atmospheric samples taken in the welder’s breathing zone indicate that the concentration does not exceed the limits specified in Division 2/Z, OAR 437-002-0382, Oregon Rules for Air Contaminants.</p> <p>(2) Nearby workers shall be afforded equivalent, effective, protection from these dangerous fumes.</p> <p><b>[Also see Table OR Q-1]</b></p>	<p><b>437-002-0288 Additional General Health Protection</b></p> <p>(1) Engineering controls, including local exhaust ventilation, must be the primary control measure for indoor workplaces, when feasible. Use respiratory protection as a control measure when engineering controls are not feasible or are insufficient to protect employees to permissible exposure levels.</p> <p>(2) When welding, cutting, or grinding operations are performed on or with the materials listed in Table OR Q-1, the protective measures indicated are required unless air monitoring samples confirm that the permissible exposure limits specified in Division 2/Z, OAR 437-002-0382, Oregon Rules for Air Contaminants are not exceeded.</p> <p>(3) For materials with substance-specific rules, employers must follow all applicable requirements in those rules.</p> <p>(4) Nearby workers with potential exposure to these air contaminants must also be provided with effective protection.</p> <p><b>[Also see Table OR Q-1]</b></p>

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<p><b>Note:</b> 1910.252(a)(3)(i) was not adopted by the Department. In Oregon 437-002-0297 applies:</p> <p><b>437-002-0297 Welding or Cutting Containers</b></p> <p>(1) No welding, torch or abrasive cutting, or other hot work shall be performed on drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, surface coatings or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked.</p> <p>(2) In order to meet the “absolutely certain” test required in subsection (1) of this rule, appropriate testing equipment shall be used prior to and frequently during the welding, torch or abrasive cutting or other hot work operation to insure that the container is free and remains free of flammable or toxic vapors.</p>	<p><b>Note:</b> 1910.252(a)(3)(i) was not adopted by the Department. In Oregon, 437-002-0297 applies, instead.</p> <p><b>437-002-0297 Welding or Cutting Containers</b></p> <p><b>NOTE:</b> Confined space rules apply when containers are large enough to enter.</p> <p>(1) A competent person must ensure that the following actions are accomplished when any hot work (such as welding, or torch- or abrasive-cutting) will be performed on drums, barrels, tanks, or other vessels that have contained flammable substances or other materials that could produce flammable or toxic vapors when subjected to heat:</p> <ul style="list-style-type: none"> <li>(a) Clean and ventilate the container to eliminate substances such as solvents, greases, tars, acids, or surface coatings that could produce flammable or toxic vapors.</li> <li>(b) Disconnect or blank any pipe lines or connections to the container unless it is determined to be necessary to release anticipated pressure during the application of heat.</li> <li>(c) Use appropriate atmospheric testing equipment prior to and during the hot work operation to ensure that the work area near the container remains within safe parameters during the application of heat.</li> <li>(d) Document the process used, including air monitoring results, to ensure safe conditions were maintained.</li> </ul> <p>(2) Retain these records for at least one year following completion of the work.</p> <p><b>NOTE:</b> Exposure to air contaminants is an exposure record that must be retained as required in 29 CFR 1910.1020 Access to Employee Exposure and Medical Records.</p>

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<p><b>Note:</b> 1910.252(c)(4)(iii) was not adopted by the Department. In Oregon OAR 437-002-0298 applies:</p> <p><b>437-002-0298 Self-Contained Units</b></p> <p><i>In areas immediately hazardous to life, self-contained breathing equipment shall be used. The breathing equipment shall be approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health.</i></p>	<p><b>Note:</b> 1910.252(c)(4)(iii) was not adopted by the Department. In Oregon, OAR 437-002-0298 applies.</p> <p><b>437-002-0298 Supplied Air Respiratory Equipment.</b> Use self-contained breathing apparatus or other supplied air respiratory equipment in areas that are immediately dangerous to life and health (IDLH) due to known respiratory hazards or to respiratory hazards that have not been fully evaluated. All respiratory equipment must be approved by the National Institute for Occupational Safety and Health and be used in accordance with the Respiratory Protection Standard, 1910.0134.</p>
<p>(No current rule)</p>	<p><b>437-002-XXXX Additional Confined Space requirements</b></p> <p>(1) When welding operations will be performed inside a confined space, evaluate the space in accordance with OAR 437-002-0146, "Confined Spaces", before work begins.</p> <p>(a) When there are potential or actual hazards within the space not directly related to the welding process, follow the requirements of 437-002-0146.</p> <p>(b) When the only actual or potential hazards associated with the space are directly related to the welding process, follow the requirements of paragraphs (2) through (6), below.</p> <p>(2) To ensure that the atmosphere remains safe for entry, continuously test the internal atmosphere of the confined space with a calibrated, direct-reading instrument.</p> <p>(a) Provide all necessary equipment at no cost to employees.</p> <p>(b) Ensure that all equipment is maintained and used in accordance with the instructions from the manufacturer.</p>

*(c) Train all employees who use the equipment in the proper use of that equipment.*

*(d) Maintain records of this monitoring data for five years from the date of monitoring.*

**NOTE:** *Exposure to any air contaminants is an exposure record that must be retained as required in 29 CFR 1910.1020 Access to Employee Exposure and Medical Records.*

*(3) If at any time during entry, monitoring indicates that atmospheric conditions are outside of the ranges recognized as safe, or if a hazardous condition is otherwise detected, ensure that all employees leave the space immediately.*

*(4) Control respiratory hazards. Either:*  
*(a) Provide forced air ventilation directed to ventilate the immediate area(s) where each employee is working within the space; and, continue until all employees have left the space.*

*(b) Or, provide and require the use of supplied air respiratory protection when ventilation is shown not to be feasible or is inadequate to protect employees from respiratory hazards.*

*(5) When forced air ventilation is relied up, it must be sufficient to protect employees entering the space from the hazards associated with the welding process inducing metal fume, gases, and smoke created from working with the specific materials.*

Current OARs	Draft OARs
(No current rule)	<p><b>437-002-XXX<del>Y</del> Manganese</b></p> <p><i>Table OR Q-2 describes levels of respiratory protection for specific welding-related tasks that may be relied upon, within the duration of time specified, to prevent exposure to Manganese above the Permissible Exposure Limit (PEL) listed in Division 2/Z, OAR 437-002-0382, Oregon Rules for Air Contaminants.</i></p> <p><i>1) The guidelines in Table OR Q-2 may be used as an alternative to air monitoring for Manganese exposure, under the following conditions:</i></p> <ul style="list-style-type: none"> <li><i>a) The employer must provide respiratory protection with the Assigned Protective Factor (APF) based on the type of welding-related task and the expected duration of that task. (See descriptions of tasks in 437-002-XXXZ.)</i></li> <li><i>b) If the duration of the task reaches the upper time limit for the APF listed, then the employer must either:</i> <ul style="list-style-type: none"> <li><i>A) End the exposures for that shift, or</i></li> <li><i>B) Provide respiratory protection with the higher APF listed in the Table for any additional performance of that task during that shift.</i></li> </ul> </li> </ul>

2) *If, during the course of a single work shift, an employee will perform more than one task listed in Table OR Q-2, the employer must add together the anticipated actual duration of all tasks and provide the respiratory protection with the most protective Assigned Protective Factor for the total duration for all tasks performed.*

**NOTES:**

*EXAMPLE #1: The employer anticipates 60 minutes of "Grinding tasks related to welding" and 90 minutes of FCAW during an employee's work shift. Although both of these tasks, performed individually for the specified time periods would fall within the APF-10 column for respiratory protection, adding 90 + 60 minutes together = 150 total minutes. For FCAW, exposures above 120 minutes fall in the APF -25 column. Therefore, to meet the conditions for the exemption from air monitoring for Manganese, you need to provide the APF -25 level of respiratory protection for the duration of both of the combined tasks.*

*EXAMPLE #2: The employer anticipates 10 minutes of "Grinding tasks related to welding" and 30 minutes of "Hand-held torch cutting" during a work shift. Although the grinding tasks, if done alone for the specified time would be below the threshold for the APF-10 column of respiratory protection, adding 10 + 30 minutes together = 40 total minutes. The combined duration of 40 minutes places both the hand-held torch work and the grinding tasks within the APF-10 column. Therefore, to meet the conditions for the exemption from air monitoring for Manganese, you need to provide the APF-10 level of respiratory protection for the duration of both of the combined tasks.*

**[Also see Table OR Q-2 for Manganese]**

## Draft OARs

### **437-002-XXXZ Definitions for terms used in Division 2/Q.**

#### **(1) Definitions**

- a. Approved:** listed or approved by a nationally recognized testing laboratory (NRTL). (See 1910.7 for NRTL requirements.)
- b. Competent person:** a person capable of identifying existing and predictable hazards in the work environment which are unsanitary, hazardous, or dangerous to employees; and who has authorization to take prompt, corrective measures to eliminate these hazards.
- c. Confined space:** A space that meets all of the following:
  - Large enough and so configured that an employee can fully enter the space and perform work.
  - Has limited or restricted means for entry or exit.
  - Is not designed for continuous human occupancy.
- d. Feasible:** Something that is possible; capable of being done, effected, or accomplished.
- e. Standard order of testing for atmospheric testing in a confined or other enclosed space:**

Before workers are allowed to enter confined and enclosed spaces, and at sufficient intervals to ensure safe conditions, a competent person must test the atmosphere in using the following order of testing

  - 1. Oxygen.** Oxygen content levels must be maintained at or above 19.5% and below 22.0% by volume. If an oxygen-deficient or oxygen-enriched atmosphere is found, ventilation must be provided at

volumes and flow rates sufficient to restore oxygen content to these safe levels.

**2. Flammable gases/ vapors.**

The concentration of flammable gasses or vapors must be maintained below 10% of the Lower Explosive Limit (LEL).

**3. Toxic vapors.** The types of toxic gases, vapors, or fumes present will depend on the types of materials being worked on and worked with. These air contaminants must be maintained below the OSHA permissible exposure limits (PELs); or in the case of contaminants for which there is no established OSHA PEL, below NIOSH's immediately dangerous to life and health (IDLH) levels. Local exhaust ventilation can remove these contaminants at their source while general exhaust ventilation -- provided at sufficient volumes and flow rates -- can restore concentrations to safe levels.

**(2) Welding, cutting or grinding tasks referenced in Table OR Q-2:**

**a. Carbon Arcing** is an arc cutting process in which metals to be cut are melted by the heat of the carbon arc and the molten metal is removed by a blast of air.

**b. Flux-Cored Arc Welding --FCAW** or FCA or MIG flux core welding is an automatic or semi-automatic arc welding process requiring a continuously fed consumable tubular electrode containing a flux. (Shielding gas is often not needed; but a constant welding current or power supply is required.)

- c. Gas Metal Arc Welding –GMAW –** or MIG Solid Wire uses a spooled, solid steel wire fed through a welding lead to the welding gun.
- d. Gas Tungsten Arc Welding – GTAW --** or Tungsten Inert Gas -- TIG Welding (also called “Heliarc” welding) uses a non-consumable tungsten electrode to produce the weld and an inert gas to shield the weld from the atmosphere.
- e. Grinding tasks directly related to the welding process** includes the preparation of metal surfaces such as the removal of coatings, rust, or oxidation and beveling or otherwise reducing the thickness at the edge of the metal to be joined by welding.
- f. Hand-held** means any welding or cutting process where the torch or electrode holder is manipulated by hand. **Torch cutting** includes heating the metal with a torch flame until it is red, then using a blast trigger to deliver a higher concentration of oxygen that forces the molten metal away, creating a cut. **Plasma Cutting** uses a high-intensity plasma arc to melt a very narrow area that pushes through the work piece and removes the molten metal.
- g. Stick Metal Arc Welding – SMAW --** uses a “stick” electrode core covered by chemical or metallic materials that provide shielding from surrounding air to complete an electrical circuit. Typically, a holder keeps the electrode at a chosen angle.

### **437-002-0280 Adoption by Reference**

*In addition to, and not in lieu of, any other safety and health codes contained in OAR Chapter 437, the Department adopts by reference the following federal regulations printed as part of the Code of Federal Regulations, 29 CFR 1910, in the Federal Register:*

(1) 29 CFR 1910.251 Definitions. Repealed. Oregon OSHA Admin. Order 6-2014, f. 10/28/14, ef. 5/1/15. In Oregon, [OAR 437-002-XXXZ](#) applies.

(2) 29 CFR 1910.252 General Requirements, published 3/26/12, FR vol. 77, no. 58, p. 17574.

(3) 29 CFR 1910.253 Oxygen-Fuel Gas Welding and Cutting. Repealed. Oregon OSHA Admin. Order 6-2014, f. 10/28/14, ef. 5/1/15. In Oregon, OAR [437-002-2253](#) applies.

(4) 29 CFR 1910.254 Arc Welding and Cutting, published 9/13/05, FR vol. 70, no. 176, p. 53925.

(5) 29 CFR 1910.255 Resistance Welding, published 4/11/90, Federal Register, vol. 55, no. 70, pp. 13710-13711.

*These standards are on file with the Oregon Occupational Safety and Health Division, Oregon Department of Consumer and Business Services, and the United States Government Printing Office.*

*Stat. Auth.: ORS 654.025(2) and ORS 656.726(4).*

*Stats. Implemented: ORS 654.001 through 654.295. Hist:*

*OR-OSHA Admin. Order 23-1990, f. 9/28/90, ef. 12/1/90.*

*OR-OSHA Admin. Order 4-1997, f. 4/2/97, ef. 4/2/97.*

*OR-OSHA Admin. Order 3-1998, f. 7/7/98, ef. 7/7/98.*

OR-OSHA Admin. Order 4-2005, f. 12/14/05, ef. 12/14/05.

OR-OSHA Admin. Order 7-2008, f. 5/30/08, ef. 5/30/08.

OR-OSHA Admin. Order 2-2010, f. 2/25/10, ef. 2/25/10.

OR-OSHA Admin. Order 1-2012, f. 4/10/12, ef. 4/10/12.

OR-OSHA Admin. Order 5-2012, f. 9/25/12, ef. 9/25/12.

OR-OSHA Admin. Order 6-2014, f. 10/28/14, ef. 5/1/15.

[OR OSHA Admin. Order x-mxmx, f. x/m/mxmx](#)  
[ef.x/m/mxmx.](#)