

## Oxygen and Fuel-Gas Welding and Cutting

OAR 437  
Division 2/Q  
Division 3/J

### Oxygen and Fuel-Gas Welding and Cutting

#### General requirements

Compared to other types of welding and cutting, using oxygen and fuel gas creates unique hazards. You can learn to recognize and control these hazards. Fuel gas examples include acetylene, methylacetylene-propadiene (MPS), propylene, hydrogen, and gasoline.

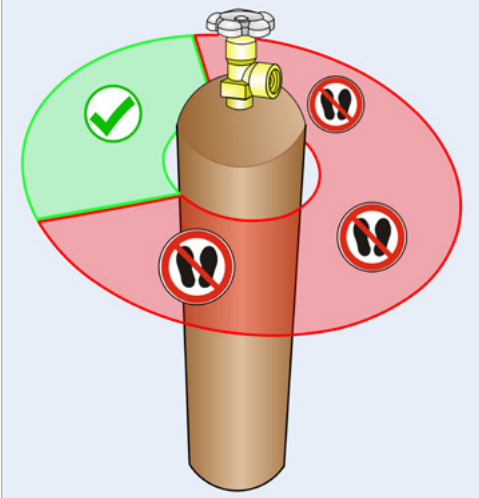
Having trained employees to properly select, maintain, and use containers, pressure-reducing regulators, hoses, and torches for compressed, liquefied, and dissolved gases will minimize the serious risk for injury and property damage. General industry and construction employers are required to follow the provisions of Division 2, Subdivision Q, 437-002-2253 Oxygen-Fuel Gas Welding and Cutting, when welding, cutting, brazing, soldering, or flame coating (thermal spraying). See the companion **Oxy-Fuel Gas Cylinder Storage** fact sheet for information on proper container storage.

#### Use of oxygen and fuel-gas equipment

Follow the manufacturer's instructions when setting up, using, and shutting down oxygen and fuel-gas welding and cutting equipment. Also follow these guidelines:

- Install and use reverse flow check valves and flashback arrestors when required by the torch manufacturer.
- Use pressure-reducing regulators approved for the specific gas.
- Use a cylinder's contents only for purposes intended by the supplier.
- Never use a damaged cylinder.
- Stand with the cylinder valve's opening facing away from your body and all other people when opening a cylinder valve (with or without a pressure-reducing regulator).
- Open oxygen cylinder valves slowly and slightly (called cracking) for an instant and then close before attaching a regulator. Cracking is an approved process that applies only to oxygen cylinders.

#### Stand behind the valve opening



#### Handling oxygen and fuel-gas containers and equipment

Selecting the proper containers and handling the equipment correctly will further reduce the risk of injury. Rules for jobsite cylinder handling include the following:

- Provide adequate access for handling cylinders.
- Remove pressure-reducing regulators and install valve protection caps before moving cylinders not secured to a special truck, cylinder hand truck, cart, or cylinder pallet.
- Move cylinders using a special truck, cylinder hand truck, cart, or cylinder pallet.
- Leave valve protection caps and valve outlet seals in place until the cylinder has been secured and is ready to be connected to a regulator or manifold.

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## Leak detection

Valves, pressure-reducing regulators, hoses, torches, and their associated connections can leak. Drop testing uses a cylinder's own internal pressure with the regulator's pressure gauges to detect a leaking oxygen or fuel-gas system. This system test, required at the beginning of each shift, detects when there is a leak between the closed valves on the container and torch handle. Drop test instructions are in OAR 437-002-2253(7)(i)(L)(i).

## Drop test procedure

- Ensure that both the oxygen and fuel control valves on the torch handle are closed.
- With the oxygen cylinder valve open, adjust the oxygen regulator to deliver a minimum of 20 PSIG (140kPa).
- With the fuel cylinder valve open, adjust the fuel regulator to deliver a minimum of 10 PSIG (70kPa).
- Close both the oxygen and fuel-gas cylinder valves.
- Turn the adjusting screws counterclockwise to relieve regulator pressure.
- Observe the gauges on both regulators for a minimum of five minutes.



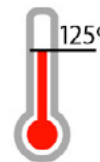
A change in the pressure gauge readings results in a failed drop test. A failed drop test confirms a leak exists, not the leak's location. Leak testing is required following a failed drop test. Leak testing uses a liquid solution, or another accepted method, to pinpoint the leak's location. Solutions must be compatible with the gas being checked. Never use a solution containing petroleum to check for an oxygen leak. Always test for leaks before transporting cylinders.

## Transporting compressed, liquefied, and dissolved gas cylinders

Never transport oxygen or fuel-gas cylinders in passenger vehicle trunks. There are special restrictions for transporting cylinders inside

enclosed vehicles, which include the interiors of automobiles, vans, trucks, and trailers. When transporting in an enclosed vehicle, take the following precautions:

- Leak check cylinders before placement into an enclosed vehicle.
- Leak check cylinders at the end of the day and again before transporting when left in an enclosed vehicle overnight.
- Maintain vehicle temperatures below 125 degrees F.
- Isolate fuel-gas cylinders from sources of ignition.
- Secure cylinders from movement.
- Remove regulators and install valve protection caps on cylinders designed to accept a cap.



When cylinders are transported outside of an enclosed vehicle, such as the open bed of a service truck, regulators can remain on cylinders when the valves and regulators are protected.

You must also comply with the U.S. Department of Transportation (DOT) Hazardous Materials Regulations (HMR) when transporting oxygen and fuel-gas containers. These containers may qualify for transportation under the Materials of Trade (MOTs) exception. Regulations that apply to MOTs are found in 49 CFR Section 173.6.

## Employee training

Employers must train employees and evaluate their ability to safely do their job before allowing them to work alone. Training must be conducted by a competent person and address the following:

- Procedures, practices, and requirements for the tasks they are expected to perform.
- Instructions for safe use, operation, and maintenance of tools, equipment, and machinery.
- Manufacturer's operating and maintenance instructions, warnings, and precautions.
- Work performance expectations.
- Hazards associated with expected tasks.
- Ways to prevent or control hazards.

## Resources

- [OAR 437, Division 2/Q, 437-002-2253 Oxygen-fuel Gas Welding and Cutting](#)
- [USDOT Material of Trade \(MOTs\) publication](#)