

# Workplace Health and Safety Bulletin



## Explosion of Mobile Carpet Cleaning Propane-Fuelled Boilers

There have recently been a number of serious injuries, and considerable property loss, resulting from the explosion of propane-fuelled water-heaters/boilers mounted inside mobile carpet and upholstery cleaning vehicles.

Propane is a colourless, odourless gas. A distinctly strong odour, like that of rotten eggs, is added to propane so that persons can detect that the gas is present i.e. a leak. Propane is heavier than air and will drift into low-lying areas. Outdoors, propane vapour usually dissipates by ever-present air currents and poses little danger. However, under calm conditions and in enclosed spaces, propane vapour can remain in low-lying areas until air currents displace it or it is ignited.

As required by section 171 of the Occupational Health and Safety (OHS) Code, propane cylinders must be secured, preferably upright. Workers using propane-fuelled equipment must be trained in how to safely use and operate it. This includes how to refuel it and how to safely shut down the equipment in an emergency. Workers refueling cylinders must ensure that the engine, pilot lights and other equipment within the vehicle that could provide a source of ignition are extinguished or switched off.

Before turning on the propane, workers should confirm that all delivery system connections are tight, that all boiler valves are turned off and any unconnected outlets are capped. The propane delivery system should not be left turned on or containers connected to it until the system has been proven to be propane-tight. After the propane has been turned on all pilot lights must be lit.

Each connection of the propane delivery system must be periodically leak tested with soap water. A lit match or other open flame must never be used when checking for leaks. Workers need to understand that if they suspect a leak or smell the rotten

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egg odour, they must immediately turn off the supply of propane at the cylinder and leave the area. Once well away from the vehicle, workers can contact their employer for further instructions, which may involve calling 9-1-1 and indicating the presence of a possible propane gas leak.

According to Alberta Municipal Affairs, Safety Services, all propane-fuelled boilers must be

- (a) approved for use in mobile carpet and upholstery cleaning applications,
- (b) installed by a certified gas-fitter, and
- (c) comply with CSA Standards CAN/CSA-B149.1 *Natural Gas and Propane Installation Code* and CAN/CSA-B149.2 *Propane Storage and Handling Code*.

The following additional requirements also apply:

- (1) A cylinder installed within a vehicle must be
  - (a) in a recess that is of metal or metal-clad construction, that is vapour-tight to the inside of the vehicle and that is accessible only from, and vented to, the outside,
  - (b) in a metal cabinet that is vapour-tight to the inside of the vehicle. The cabinet must be vented downwards from the bottom of the cabinet by means of a tube not less than 25 mm (1 inch) in diameter that terminates at a point outside the vehicle and is directed away from any source of ignition on the vehicle, or
  - (c) on a cylinder support bracket that extends below the level of the floor but not below the bottom of the vehicle frame. The cover for that part of the cylinder extending above the floor must be of metal-clad construction that is vapour-tight to the interior of the vehicle.
- (2) A tank located within an enclosed space of a vehicle must be
  - (a) provided with a rigid gas-tight assembly that seals all tank equipment, inlets and outlets from the interior of the vehicle, and
  - (b) equipped with remote fill outside fittings and installed with a conduit to prevent leakage from the piping, tubing and/or hose assembly from entering the interior of the vehicle. The remote fill outside fittings must be located to provide easy access for refueling without requiring a person to kneel or lie on the ground.
- (3) Propane piping or tubing must be located or protected to prevent damage to it. Defects in propane piping or tubing must not be repaired. Inferior or defective material must be replaced.
- (4) The discharge from any regulator that is equipped with an internal relief valve must be vented to a safe location outdoors.

- (5) The propane-fuelled boiler must be provided with air for combustion. An open door may be used as a means of providing combustion or ventilation air as long as the door is interlocked to the propane supply to ensure that the door remains open while the boiler is operating.
- (6) Vehicles equipped with a propane-fuelled boiler must not be parked or stored indoors except when
  - (a) propane storage cylinders have been removed,
  - (b) propane storage tanks have
    - i. the propane contents reduced to not more than 50% of their maximum permitted filling density, and
    - ii. all shut-off valves are in the closed position, or
  - (c) the parking facility is acceptable to the authority having jurisdiction.
- (7) A mobile propane installation must be inspected and re-qualified at five-year intervals by a qualified person acceptable to the authority having jurisdiction. Removable cylinders must be inspected and re-qualified every 10 years.


Further technical information about the use of propane and propane in vehicles is available by contacting Safety Services at 1-866-421-6929 or by e-mail at [safety.services@gov.ab.ca](mailto:safety.services@gov.ab.ca). Technical staff is available to answer specific questions and concerns.


*This Safety Bulletin was prepared by Safety Services  
with the assistance of Workplace Health and Safety*

## Contact us:

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### Province-Wide Contact Centre

 Edmonton & surrounding area:  
780-415-8690

 Throughout Alberta:  
1-866-415-8690



Deaf or hearing impaired

- In Edmonton: **780-427-9999**

or

- **1-800-232-7215**  
throughout Alberta

### Web Site



[www.worksafe.alberta.ca](http://www.worksafe.alberta.ca)

## Getting copies of OHS Act, Regulation & Code:

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### Queen's Printer



[www.qp.gov.ab.ca](http://www.qp.gov.ab.ca)



Edmonton 780-427-4952

### Workplace Health and Safety



<http://employment.alberta.ca/whs-ohs>

Call any Government of Alberta office toll-free  
Dial 310-0000, then the area code and telephone number you want to reach

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