

## Non-bonded fuel hoses create fire and explosion hazards

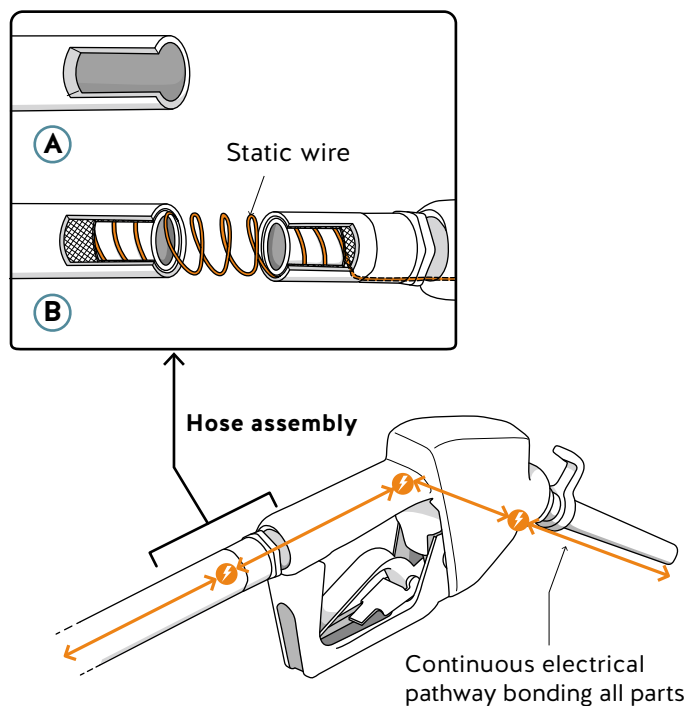
Since 2014, two workers in B.C. have been seriously injured in flash fires linked to non-bonded fuel hoses (i.e., hoses that cannot dissipate static electricity). In the second incident, the worker's injuries were fatal. This bulletin explains the hazards. It is our aim to ensure that everyone involved in the storage, transportation, delivery, and transfer of fuel understands that fuel hoses must be adequately bonded and should be designed to meet the requirements of ULC Standard CAN/ULC-S612 for dissipating static electricity.

Hydrocarbon fuels like diesel and gasoline are capable of both generating and storing static electricity. A means of dissipating static electricity must be built into any system used for storing, handling, transferring, or dispensing flammable or combustible liquids used as fuel.

Static electricity is created when materials move against each other or when an uncharged object comes near a charged surface. Once generated, static electricity can remain stored on materials or on workers without any obvious indication it's there. In flammable or explosive atmospheres, a discharge of static electricity can become an ignition source, resulting in fires and/or explosions.

Bonding involves connecting all components in a system using a conductive material, usually a wire. Bonding ensures that the static charge remains the same between the materials, preventing potentially dangerous static sparks.

ULC Standard CAN/ULC-S612 provides guidance on the construction and testing of hoses and hose assemblies used for storing, handling, transferring, or dispensing flammable and combustible liquids.



Cutaway views of a non-bonded fuel hose (A) and a bonded, ULC-approved fuel hose (B) next to a fuel nozzle. To reduce the risk of a static spark, the electrically bonded hose and nozzle must create a continuous path for electricity through all parts of the dispensing system. Note that nozzle designs may vary across industries.

National Fire Protection Association (NFPA) Standard 77 provides guidance on hazard evaluation and control.

## Safe work practices

### Employers and owner/operators

- Ensure that fuel suppliers' equipment meets appropriate standards and regulations for dissipating static electricity.

### Fuel handlers

- Check that fuel hoses meet the requirements of ULC Standard CAN/ULC-S612 for dissipating static electricity. Look for a ULC label or sticker on the hose assembly.
- Follow the equipment manufacturer's instructions and your employer's written safe work procedures for grounding the bonded system.

### Fuel suppliers (fixed and mobile)

- Install and maintain fuelling hoses in accordance with the ULC standard for dissipating static electricity.

## Exceptions

Note that ULC Standard CAN/ULC-S612 does not apply in all cases. Some fuelling applications have different needs that are addressed by different standards. Examples include:

- Hoses and hose assemblies for aircraft refuelling or components in automotive vehicles
- Settings where conductive hoses would create a hazard (such as high-voltage installations)

Every employer who stores, handles, transfers, or dispenses flammable or combustible liquids used as fuel should immediately inspect the equipment involved to ensure that all components of the system are bonded together.

## For more information

### *Workers Compensation Act*

- [Section 21, General duties of employers](#)
- [Section 22, General duties of workers](#)
- [Section 23, General duties of supervisors](#)
- [Section 24, General duties of suppliers](#)

### Occupational Health and Safety Regulation

- [Section 4.3, Safe machinery and equipment](#)
- [Section 5.27, Ignition sources](#)
- [Section 23.6, Control of static electricity](#)

### Related bulletins

- [Diesel trucks, fuel tank vent systems, refuelling, and the risk of flash fires](#)
- [Hydrocarbon storage tank explosions and static electricity](#)
- [Awareness and control of static electricity in manufacturing](#)

### Resources from other organizations

- [CAN/ULC-S612:2016, Standard for Hose and Hose Assemblies for Flammable and Combustible Liquids](#)
- [NFPA 77 \(2014\), Recommended Practice on Static Electricity](#)