WorkSafe BC

WorkSafe Bulletin

Reducing the risk of fires or explosions when spraying flammable products

Spray-applied products often contain flammable ingredients that can ignite when mixed in the air during spraying operations. Ignition sources include open flame, nearby electrical equipment, and inadequately designed ventilation systems. The tips in this bulletin can help you prevent fires and explosions from airborne flammable products applied in the workplace.

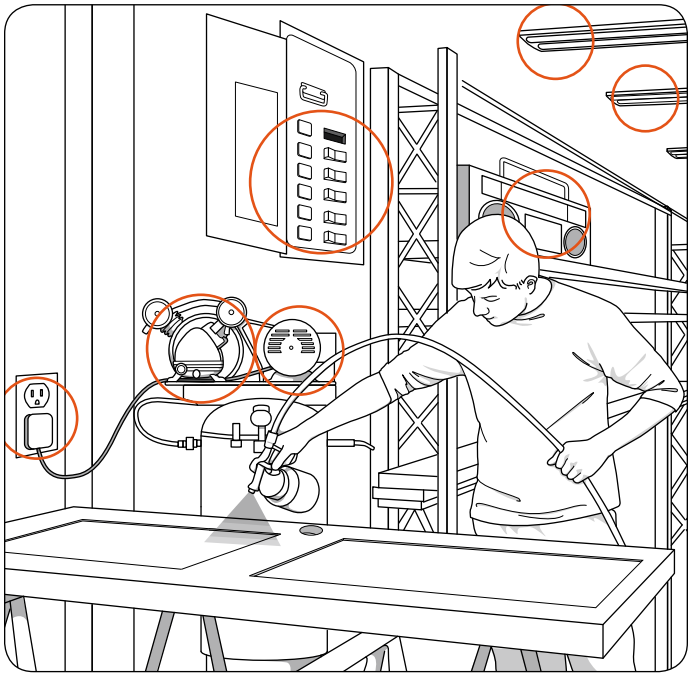
Many manufacturing processes include the spray application of flammable products. These processes include:

- Painting manufactured steel, wood, or other products
- Applying varnishes and other seal coatings
- Using solvent-based resins and adhesives

Spraying flammable products creates aerosols and vapours that can ignite when mixed with air.

What increases the risk of ignition?

- When flammable products are applied outside of an appropriately designed and maintained spray enclosure, the risk increases dramatically. Nearby electrical equipment, open flame, or ventilation systems not designed for flammable products can cause ignition of airborne flammable products.
- Inadequately maintained ventilation systems can contribute to concentrations of airborne flammable aerosols and vapours in the workplace. High concentrations of aerosols and vapours in the air can be explosive.



The drawing above shows some potential ignition sources in a spraying operation. Other risks include inadequate ventilation and the lack of personal protective equipment.

When is a fire or explosion most likely to occur?

A fire or explosion can occur when flammable aerosols and vapours are mixed with air in

a concentration between the product's lower explosive limit (LEL) and its upper explosive limit (UEL) and encounter an ignition source.

Concentrations of flammable aerosols and vapours can grow quickly when spraying occurs indoors or without adequate ventilation.

Reducing the risk

As an employer, you can reduce the risk by following these steps:

- Identify the products used in your spraying operations.
- Consult the safety data sheet (SDS) for each product you spray to determine whether it is flammable.
- Follow safe handling and storage instructions from the SDS.
- Ensure that electrical equipment and ventilation systems in your workplace are appropriately designed for spraying operations. You'll need to consider the requirements of the BC Fire Code and the BC Electrical Code.
- Consider installing a properly designed spray enclosure in your workplace.

Responsibilities

Owners and employers

Owners and employers must ensure that:

- Spraying process hazards are correctly identified.
- Spraying processes are conducted in suitable work environments.
- Workers are trained in safe work procedures for spraying.

Supervisors

Supervisors must ensure that workers are knowledgeable in and comply with safe work procedures.

Workers

Workers must follow safe work procedures and use proper personal protective equipment for the task.

Regulation requirements

For requirements related to the application of flammable spray products, see the following sections of the Occupational Health and Safety Regulation and its related guidelines (available on worksafebc.com).

- Sections 12.127–12.141, Painting, coating and work with plastics and resins
- Section 5.27–5.35, Flammable and combustible substances

Resources

The following resources are also available on worksafebc.com:

- *Health and Safety for Small- and Medium-Sized Woodworking Shops*
- Access to Standards (allows visitors to view and/or purchase standards set by the Canadian Standards Association [CSA] and other organizations)

For more information

- Technical Safety BC, previously known as the BC Safety Authority (administers the BC Electrical Code)
- Office of the Fire Commissioner (administers the BC Fire Code)