



RISK RESILIENT

Spontaneous Combustion
Commercial

Spontaneous combustion is a serious and often overlooked risk where a fire can ignite without any flame, spark, or warning. Spontaneous combustion is a by-product of spontaneous heating. It occurs when a material with a low-ignition temperature self-heats, reaches its ignition temperature, and catches fire. Materials that are most susceptible to spontaneous combustion include oils, solvents, hay, straw, peat, wood chips, sawdust, compost, and other similar materials. It's also worth noting that absorbent materials, like rags/cloths, don't alter the properties of the liquids they absorb. A rag soaked with a combustible liquid remains combustible.

Know the Risks

The mishandling of oil or stain-soaked rags is the most common hazard that causes spontaneous combustion fires in residential and commercial occupancies. The oils commonly used in oil-based paints and stains heat as they dry, and if this heat is not released into the air, it can build up and cause a fire. Examples of common materials that can spontaneously combust include:

- Oil based products like: floor finish, sealer, primer, paint shellac, linseed oil, paint thinner
- Rags/cloths and waste with oil-based products
- Sawdust and wood soiled chips in piles
- Compost and green waste piles
- A number of chemical substances

More specifically, materials can be further subdivided based on their propensity to spontaneously combust:¹

Strong Propensity
Charcoal • Cod liver oil • Fish oil • Fishmeal • Fish waste • Linseed oil • Clothing, silk, fabrics and rags soaked with oil • Tung nut flour (or tung, or Chinese wood) • Peanut seed coat (skin covering the peanut, under the shell) • Pigments in Oil • Cornmeal based pet food
Average Propensity
• Food for animals • Foam rubber • Certain metallic powders • Bituminous coal • Fertilizers • Hay • Coconut bark • ManureDistillery or brewery beans • Whale oil • Cottonseed oil • Corn oil • Menhaden oil • Perilla oil • Pine oil • Soybean oil • Tung oil (or tung oil, or Chinese wood) • Red oil (unrefined palm oil) • Roofing papers and felts • Paint containing drying oils • Pyrite • Rubber residue • Wool residue • Paper waste
Low Propensity
• Cotton seeds • Mustard oil • Palm oil • Peanut oil • Turpentine

1 Standards, Equity, Occupational Health and Safety Commission. January 21, 2008. Spontaneous Combustion. Retrieved December 17, 2020 from: <https://reptox.cnesst.gouv.qc.ca/chimie/Pages/combustion-spontanee.aspx>



Did you know...

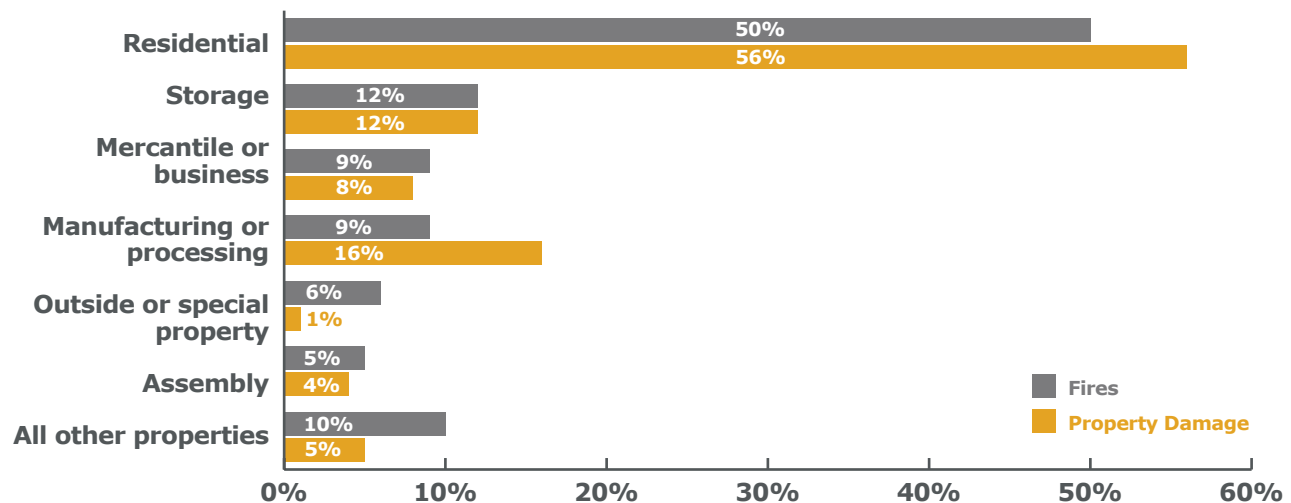
25% of the fires in manufacturing properties began with oily rags.

Source: National Fire Protection Association (NFPA). Fires Caused by Spontaneous Combustion or Chemical Reaction Fact Sheet. Retrieved December 11, 2020 from: <https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Fact-sheets/CombustionFactSheet.ashx>

When does spontaneous combustion occur?† Examples include:

- Improper handling of oil-based products
- Improper disposal of a wiping cloth, rag, towel, drop cloth, steel wool or piece of work clothing that has come into contact with a solvent-based material
- Warm environments that contribute to the internal heat generated by material such as compost piles
- Improper collection and disposal of sawdust

Structure Fires Caused by Spontaneous Combustion or Chemical Reaction By Property Use 2005-2009



Source: National Fire Protection Association (NFPA). Fires Caused by Spontaneous Combustion or Chemical Reaction Fact Sheet. Retrieved December 11, 2020 from: <https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Fact-sheets/CombustionFactSheet.ashx>

Be Prepared

The best way to prevent spontaneous combustion is to follow safety protocols for the handling and disposing of potentially hazardous materials. Consider these tips to ensure the combustible materials used in your operations are properly handled and disposed of:

Oil-soaked Rags

The most common hazard that causes spontaneous combustion is the handling of oil-soaked rags. These rags should be properly disposed in an approved self-closing waste container. JUSTRITE galvanized steel waste cans are certified by FM Global (FM) and Underwriters Laboratories of Canada (ULC) as an approved method for disposing oily waste.



Some of the features of this system include:

- The self-closing lid limits the oxygen source to reduce the risk of spontaneous combustion.
- The round construction and raised bottom increases air circulation to disperse heat build up.
- The self-closing drum covers provide an easy and inexpensive way to convert steel drums into fire safe receptacles.
- A replaceable fusible link assembly inside the cover melts at 165°F, automatically closing the cover shut if a fire occurs inside the drum.

All oily-soaked waste should be removed at the end of the day and placed in a metal or steel container with a tight-fitting lid that is filled with water. An approved third-party contractor should be used for disposal of the contents.

Source: Justrite. Oily Waste Can, 14 Gallon, Hand-Operated Cover. Retrieved December 11, 2020 from: <https://www.justrite.com/oily-waste-can-14-gallon-hand-operated-cover>

Compost Piles

First and foremost, the open storage of compost piles should always be kept a reasonable distance away from buildings. The piles should be small to allow for the circulation of air and the dissipation of heat generated from its natural occurring decomposing of organic material.

It's prudent to churn the pile regularly to help maintain uniform bulking / avoid compacting wet organics, as well as to maintain uniform moisture throughout the decomposition process.

Finally, it's prudent to monitor the pile's temperature and take proactive measures to manage temperatures from getting too high, such as turning, churning, and sprinkling water on the materials.††

Sawdust

Similar to compost, sawdust should be temporarily stored away from buildings prior to disposal.

The risk mitigation best practices for woodworking operations can also help reduce the risks of the materials spontaneously combusting. Sawdust should be collected in bags manually or by a dust collection system, emptied often, and treated as a fire hazard. This is especially important if the dust is derived from wood that was coated with a finishing or other volatile solvent. For larger woodworking operations, outdoor cyclone collectors should be cleaned and clear of sawdust on a regular basis by a service contractor.

While it's important to take these measures into account, saw dust and wood chips are most likely to spontaneously combust when kept/stored in large piles. As such, it's advised to limit pile heights to 25 feet.²

In Summary

The proper handling and disposal of combustible materials is your best line of defense. Grow your awareness of what materials are deemed combustible and carefully read warnings and hazard labels to ensure you're aware of the risks. Taking a proactive and vigilant approach is key.

Visit [sovereigninsurance.ca](https://www.sovereigninsurance.ca) to learn more.

† City floor supply. What is spontaneous combustion and how can you prevent it? Retrieved December 16, 2020 from: <https://blog.cityfloorsupply.com/what-is-spontaneous-combustion-and-how-can-you-prevent-it/>

†† New Mexico State University. Spontaneous Combustion in Compost. Retrieved December 11, 2020 from: <https://bernalilloextension.nmsu.edu/mastercomposter/spontaneous-combustion.html>

² FM Data Sheet 8-27, paragraph 2.1.2.1