

HOW TO PREVENT HOUSE FIRES CAUSED BY CHEMICAL REACTIONS

Fires caused by chemical reactions are an increasingly common cause of house fires¹. Residential chemical fires occur most commonly when volatile vapors from gasoline and other petroleum liquids reach a flash-point temperature or when the fumes contact a source of open flame. Another common type of chemical fire is spontaneous combustion—the reaction of chemicals combining with oxygen in the air to produce enough heat to reach a flashpoint and ignite in flame. Chemical fires of various types cause approximately 14,000 fires each year, according to the National Fire Protection Association, and while a relatively small number of these are residential fires, they can be especially deadly because they are so unexpected. Common sources of this kind of fire are the gasoline or other fuel used to power lawn equipment, and oily rags.

Tips for safely storing gasoline:

- Use an approved container. The best storage container for gasoline is a red plastic container that is printed with labeling identifying it as an approved container.
- Fill the container no more than 95 percent full. This allows a space for vapors to expand without rupturing the container.
- Keep containers tightly sealed to prevent gas vapors from escaping and possibly reaching a source of flame or spark.
- Store the container at least 50 feet away from pilot lights and ignition sources, such as the heat, sparks, and flames from a water heater, space heater, or furnace. A detached garage or shed is an ideal spot to store these fuels. If no such space exists, then store fuel containers on the outside wall of an attached garage, as far as possible from living spaces.



Chemical fires can occur when oily rags spontaneously heat up. Never store oil-soaked or chemical-soaked rags after they are used, and never stack them in a pile, because heat can be spontaneously generated as the fumes combine with oxygen. Oils commonly used in oil-based paints, stains and varnishes release heat as they dry. A pile of oily rags can be dangerous because as they dry, the heat is trapped and builds up to potentially cause a fire. Vapors from flammable and combustible liquids can also ignite, causing a fire. Many commonly used flammable liquids include gasoline, lacquers and nail polish while common combustible liquids include paint thinner, oil-based paints and stains.

Safety tips for storing wet, oily rags:

- Never leave cleaning rags in a pile. At the end of the day, take the rags outside to dry.
- Hang the rags outside or spread them on the ground. Weigh them down. Do this so they do not blow away. Make sure they are not in a pile. Keep them away from buildings.
- Put dried rags in a metal container. Make sure the cover is tight. Fill the container with a water and detergent solution. This will break down the oils.
- Keep containers of oily rags in a cool place. Keep them out of direct sunlight. Keep them away from other heat sources. Check with your town for information on disposing of them.

Safety tips for storing flammable or combustible liquids:

- Flammable and combustible liquids should not be used near an open flame. Do not smoke when working with these liquids.
- If you spill liquids on your clothing, remove your clothing and place it outside to dry. Once dry, clothing can be laundered.
- Keep liquids in their original containers. Keep them tightly capped or sealed. Never store the liquids in glass containers.
- Use gasoline only as motor fuel. Never use it as a cleaner. Never use it to break down grease. Never bring gasoline indoors, even in small amounts.
- Store gasoline ONLY in a container that is sold for that purpose. Make sure the container is tightly capped when not in use. NEVER store gasoline containers in a basement or in the occupied space of a building. Keep them in an outbuilding, a detached garage, or a shed outdoors.

Note: Most Fire Department websites list preventative measures that should be taken to prevent housefires.

¹ San Rafael, Mill Valley, Corte Madera, Larkspur, and Tiburon have all experienced house fires in the last 18 months that were caused by improper disposal of rags materials used to stain or paint. The property lost to fire could have easily been prevented. Marin IJ has reported on these fires. For additional tips see: <https://rossvalleyfire.org/news/entry/homeowner-safety-tips-using-stains-and-oils>