

MAFES Dawg Tracks

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MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

*Spontaneous
Combustion*

Spontaneous combustion has always peeked my curiosity. It refers to the phenomenon that occurs when an object suddenly bursts into flame without obvious cause. But actually there is a cause – this spontaneous combustion or spontaneous ignition, as it is often called, is the occurrence of fire without the application of an external heat source. It's due to a chemical, biological, or physical processes; a runaway temperature rise in a body of combustible material that results from heat being generated by some process taking place within the body. This process makes combustible materials self-heat to a temperature high enough for ignition to occur. According to the National Fire Protection Association (NFPA), an estimated 14,070 fires occur annually from spontaneous combustion.

Examples of common materials that are prone to spontaneous combustion:

Oily Rags:

Carbon-based animal or vegetable oils, such as **linseed oil, cooking oil, cottonseed oil, corn oil, soybean oil, lard and margarine**, can undergo spontaneous combustion when in contact with rags, cardboard, paper or other combustibles. These unsaturated compounds can be dangerous when combustible materials containing residue are not properly disposed of or they come in contact with other combustible materials.

A common example is with linseed oil used to finish wood, including **some exterior deck sealers and wood stains**. Heat is generated during the drying process and therefor a pile of oil-soaked rags act as an insulator, allowing the oxidizing oil to become hot enough to cause the cloth to smoke and eventually ignite. The bigger the pile, the greater the possible heat and the greater the risk.

Petroleum based oils like motor oil, grease, diesel & gasoline on rags are not a concerns for spontaneous combustion (although don't forget to keep them away from sparks).

Prevention

1. Large quantities of oily rags should be dispose in an approved enclosed, metal container to await pickup by an industrial cleaning company.

2. When you have a single or small amount of oily rags, allow the rags to dry before disposal. Spread the soiled rags in a single layer outdoors on concrete or a metal rack to prevent the buildup of heat and allow the rags to become hard and brittle. Place the rags out of direct sunlight and secure the corners to prevent movement by wind. Once dry they are safe for disposal.

Hay:

Forage crops are always contaminated with countless microorganisms. These microorganisms are no problem when the hay is harvested and cured to the proper moisture content before baling and storage. After baling, however, a small supply of air and a favorable moisture level cause the microorganisms to begin to feed and multiply, generating heat in the process. The principal way to avoid fire resulting is to bale hay at **proper moisture levels**. Hay in round bales should contain no more than 18% moisture when placed inside a barn, while hay in small rectangular bales should contain no more than 20% moisture. Bales known to contain, or suspected of containing, excessive moisture can be temporarily loosely stacked outside, then moved inside after the danger of fire is past.

Prevention

1. Whether stacked in the field or placed in a barn, new hay should be checked frequently for possible heating. At first, check in the morning and afternoon. If no signs of abnormal heating are found, the intervals may be lengthened. If the temperature reaches 130°F, move the hay to allow increased air circulation and cooling.
2. Protect the bales from ground moisture and runoff by placing them on a bed of gravel, old tires, poles or pallets. If storing hay inside, be sure the barn roof and any plumbing do not leak. Likewise, provide adequate drainage so water will not enter the barn during storms. Hay may be at the proper moisture content when baled and stored, but wetting from a leak can allow bacterial activity to increase and result in a fire.

Sources:

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