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FIRES

Each year fire kills thousands of people, and destroys billions of dollars worth of property. These losses can be prevented. Industrial plants, laboratories, research centers, science laboratories, and, yes, **job sites** are stocked with flammable and combustible liquids, gases and solids.

For a fire to start, three conditions must be met at the same time. There must be something to burn -- a fuel; a source of oxygen -- an oxidizer; and most importantly, there needs to be an initiating event that imparts sufficient energy to start a chain reaction -- an ignition source. It is these three factors that essentially create a chain reaction that results in the rapid oxidation of a fuel -- fire.

Fuels: Fuels are materials that burn; the higher the temperature, the easier and quicker they burn. Common fuels include: diesel fuel; gasoline; solvents, such as acetone, alcohol and toluene; gases, like acetylene and propane; and solids, such as wood, paper and ordinary trash. Additionally, dust and even metal shaving can be a fuel under the right circumstances.

Oxidizers: Although ordinary air is 80 percent non-burning nitrogen, the remaining 20 percent is oxygen, and is more than enough to support combustion. In some cases fires can be prevented by displacing the air with a non-burning atmosphere, like helium, argon or pure nitrogen. Fire extinguishers generally remove oxygen from the fire event thus eliminating the fire.

Some materials release oxygen when they burn. These substances, called "oxidizers" or "oxidizing agents", are capable of releasing oxygen to a potential fire. Common oxidizers include acids, especially nitric and perchloric acids; chlorine dioxide; and other oxidizing agents such as potassium permanganate and potassium chlorate. These oxidizers must be stored away from all flammable materials. The material safety data sheet of the chemical products you are using is the best source for finding its chemical properties.

Source of Ignition: An ignition source can be a lit cigarette, a spark, static electricity, arcs from faulty electrical equipment, or even a hot light bulb. The hot surface of a heating unit may also be at a high enough temperature to serve as an ignition source.

Routine use of flammable gases, solids or solvents must occur in well ventilated areas, isolated from ignition sources.

Always remember: the combination of a fuel and a source of oxygen, along with a source of ignition can result in a fire. Fire prevention consists of ensuring that the three conditions required for a fire do not exist at the same time.