YOUR SAFETY Department
SAFETY Solutions

FIRE SAFETY

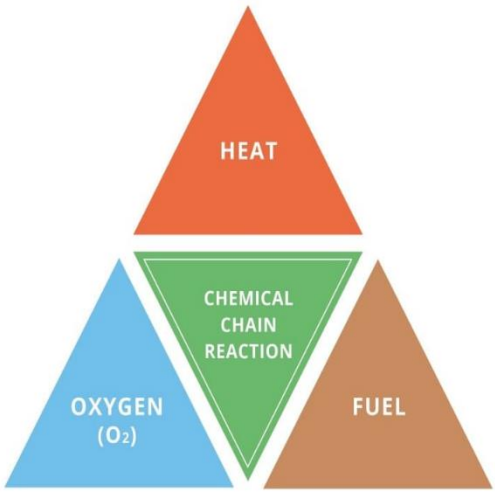
A sudden explosion of flammable liquid or combustible gas, and the rapid spread of fire can quickly transform an industrial facility into an inferno. The danger is compounded by thick, irritating smoke filled with deadly gases given off in combustion, such as hydrogen cyanide, acrolein, carbon monoxide, oxides of nitrogen, and many others. Panic and confusion can also contribute to a catastrophic result.

The nightmare of an industrial fire can have devastating effects such as loss of life, permanent disfgurement due to burns, respiratory problems, staggering property damage, closures, and loss of jobs. Most industrial fires are caused by malfunctioning electrical and mechanical equipment, improper handling of fammable liquids, poor housekeeping, sparks from hot work activities, careless smoking, and arson.

Being able to recognize fire hazards and knowing which control measures to select are two key ingredients in an effective fire prevention program. Once a fire has begun, early detection is essential in order to allow enough time for everyone to safely evacuate the building. Every employee must be familiar with the facility's fire plan, know the exact location of all fire exits, and have practice in what to do in the event of a fire.

FIRE TRIANGLE

The fire triangle or combustion triangle is a simple model, from the science of firefghting, for understanding the ingredients necessary for most fires. The "triangle" illustrates the rule that in order to ignite and burn, a fire requires three elements: heat, fuel, and oxygen. The fire is prevented or extinguished by "removing" any one of them. A fire naturally occurs when the elements are combined in the right mixture (e.g., more heat needed for igniting some fuels, unless there is concentrated oxygen).



- Oxygen Source - Approximately 16 percent of oxygen is required to sustain a fire. Normal air contains 21 percent oxygen. Some fuel material contains suffcient oxygen within their makeup to support burning.
- Heat Source - Items such as another open fame, the sun, hot surfaces, sparks or arcs, electrical energy, friction and chemical energy are all examples of heat sources.
- Fuel Sources - can either be a gas (natural gas, propane, acetylene), a liquid (gasoline, turpentine, paint, oils) or a solid (wood, paper, grease, cloth). These would be examples and by no means the only source of fuel.

FOR ENQUIRIES:

YOUR SAFETY DEPARTMENT, LLC

P + 1 888 859 5653
info@yoursafetydept.com
www.yoursafetydept.com

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FIRE TETRAHEDRON

The fire triangle is a useful teaching tool but fails to identify the fourth essential element of fire: the sustaining chemical reaction. It has largely been replaced in the industry by the fire tetrahedron which is a triangular pyramid having four sides (including the bottom).

Some fire suppression agents do not remove or reduce any of the three necessary components, but rather interfere with their chemical combination, such as Halon. In most fires, it does not matter which element gets removed; the fire fails to ignite, or it goes out. However, there are certain chemical fires where knowing only the "fire triangle" is not good enough. For fire to continue the following four things are needed: fuel, oxygen, heat, and chemical reactions. Take away one of the four items mentioned above, and the fire goes out.

CONTROLLING FIRE HAZARDS

Employers are required to provide proper exits, firefighting equipment, and employee training to prevent fire deaths and injuries in the workplace.

- BUILDING FIRE EXITS: Each workplace building must have a means of escape to be used in a fire emergency. Fire doors must not be blocked or locked to prevent emergency use when employees are within the buildings. Exit routes from buildings must be clear and free of obstructions and properly marked with signs designating exits from the building.

- PORTABLE FIRE EXTINGUISHERS: Each workplace building must have a full complement of the proper type of fire extinguisher for the fire hazards present. Employees expected or anticipated to use fire extinguishers must be instructed on the hazards of fighting fire, how to properly operate the fire extinguishers available, and what procedures to follow in alerting others to the fire emergency. Only approved fire extinguishers are permitted to be used in workplaces, and they must be kept in good operating condition. Proper maintenance and inspection of this equipment is required.

- ALARM SYSTEM: The alarm system may be voice communication or sound signals such as bells, whistles, or horns. Employees must know the evacuation signal. Training of all employees in what is to be done in an emergency is required.

- FIRE SUPPRESSION SYSTEM: Professionally designed and installed fixed fire suppression systems enhance fire safety in the workplace. Automatic sprinkler systems throughout the workplace are among the most reliable firefighting means. The sprinkler system detects the fire, sounds an alarm, and puts the water where the fire and heat are located. Automatic fire suppression systems require proper maintenance to keep them in serviceable condition.

- EMERGENCY EVACUATION PLANNING: Emergency action plans are required to describe the routes to use and procedures to be followed by employees. Also, procedures for accounting for all evacuated employees must be part of the plan. The written plan must be available for employee review. The preferred means of alerting employees to a fire emergency must be part of the plan and an employee alarm system must be available throughout the workplace complex and must be used for emergency alerting for evacuation.

- FIRE PREVENTION PLAN: Employers need to implement a written fire prevention plan to complement the fire evacuation plan to minimize the frequency of evacuation. House- keeping procedures for storage and cleanup of flammable materials and flammable waste must be included in the plan. Handling and packaging procedures must also be included in the plan. Procedures for controlling workplace ignition sources such as smoking, welding and burning must be addressed.

CONCLUSION

Respect the serious consequences a fire can have. Learn to recognize and control all types of fire hazards at your facility. Commit the fire plan to memory. Practice safe work habits whenever you are in contact with flammable or combustible liquids and gases. And do not forget to dispose of those oily rags and other flammable waste in fireproof containers.

With the proper attention to prevention planning, the risk at your facility can be greatly reduced. It sounds like a cliche, but the best way to fight fire is to prevent it from happening in the first place.

MINUTES OF MEETING

Date:_____**Person Conducting Meeting:**_____

Topic:_____

Branch: _____**Division:**_____

Attendees:

NAME	INITIAL	DATE

NAME	INITIAL	DATE

Additional Items Discussed:

_____

_____

Problem Areas or Concerns:

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Comments:

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