Fire prevention

Every year fire and its effects represent substantial losses to organizations. It is essential, therefore, that everyone is familiar with fire procedures and the measures to prevent fire.

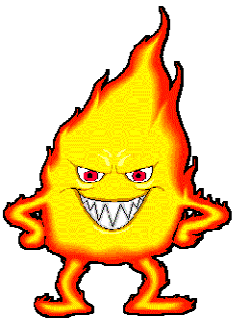
What is fire?

'Fire' can be defined in several ways:

• A spectacular example of a fast chemical reaction between a combustible substance and oxygen accompanied by the evolution of heat.

• A mixture in gaseous form of a combustible substance and oxygen with sufficient energy put into the mixture to start a fire.

• An unexpected combustion generating sufficient heat or smoke resulting in damage to plant, equipment, goods and/or buildings.



Principles of combustion

In order to appreciate the principles of fire prevention, it is necessary to have a broad understanding of the principles of combustion. The three requirements for a fire to start and continue are the presence of fuel to burn, an ignition source of sufficient energy to set the fuel alight and air or oxygen to maintain combustion. If one of these three components is removed, combustion cannot take place.

Heat may be transferred by convection, conduction and radiation.

The main causes of fire and fire spread

Past studies by the Fire Protection Association into the causes of a range of industrial fires have indicated the following as the principal sources of fire in production and storage areas:

Production areas

1. Heat-producing plant and equipment
2. Frictional heat and sparks
3. Refrigeration plant
4. Electrical equipment – setting fire to:

a) materials being processed;

b) dust; and

c) waste and packing materials.

Storage areas

1. Intruders, including children
2. Cigarettes and matches
3. Refuse burning
4. Electrical equipment – setting fire to:

a) stored goods; and

b) packing materials.

Fire instructions

A fire instruction is a notice informing people of the action they should

take on either:

a) hearing the alarm; or

b) discovering a fire.

Other requirements

In addition to displaying fire instructions, people:

a) should receive training in evacuation procedures i.e. fire drills, at least quarterly; and

b) the alarm should be sounded weekly.

It is advantageous to have key personnel trained in the correct use of fire appliances

Fire alarm systems

A method of giving warning of fire is required in commercial, industrial and public buildings. The purpose of a fire alarm is to give an early warning of a fire in a building:

a) to increase the safety of occupants by encouraging them to escape to a place of safety;

b) to increase the possibility of early extinction of the fire thus reducing the loss of or damage to the property.

In larger buildings this may take the form of a mains operated system with break glass alarm call points, an automatic control unit and electrically operated bells or sirens.

In small buildings it would be reasonable to accept a manually operated, dry battery or compressed air-operated gong, klaxon or bell. To avoid the alarm point being close to the seat of a fire, duplicate facilities are necessary.

Storage and use of flammable substances

The following points need consideration:

1. Flammable liquids

Separate storage; storage of smallest quantities in the work area; transport in closed containers; correct labelling; safe dispensing; fire appliances available during use and dispensing; adequate ventilation; no smoking or naked lights.

2. Liquefied and compressed gases

Store and transport in upright position; store in open well-ventilated area out of direct sunlight; secure with walls chains or racks; oxygen cylinders stored separately; no handling by the valves; no dropping or rolling of cylinders; turn off at bottle valve when not in use.