WHY FLAMMABLE LIQUIDS NEED CAREFUL HANDLING

It is important to remember that it is the vapours given off from a flammable liquid that burns and not the liquid itself. When these vapours combine with the correct amount of oxygen or some other oxidising agent and a source of ignition is introduced the vapours will burn.

Flash Point

Most flammable liquids have flash points at, or below, room temperature.

In other words, vapour is given off into the air at that temperature, and this layer of vapour will burn when an ignition point is brought near.

Such liquids are often described as 'volatile'. As ambient temperature increases their volatile nature increases correspondingly.

An example of low flash point fuel is petrol. Petrol will release vapours at -430°C. On the other hand, lubricating oil has a flash point of around 2000°C. In other words, lubricating oil needs to be heated to 2000°C before it will vaporise.

Specific Gravity

The specific gravity (SG) of a liquid indicates whether it is lighter or heavier than water. The SG of water is one kilogram per litre. A fluid with a SG less than one will float on water, (e.g. petrol which has a SG of 0.65), or will sink if greater than one (e.g. glycerine which has a SG of 1.25).

Most flammable liquids are lighter than water and will float on the surface. Water may, therefore, spread flammable liquid spills and burning fuels over a larger area.

Other flammable liquids, such as alcohol, may be water soluble. This may also have the effect of water spreading the burning fuel.

Vapour Density

The vapour density of flammable liquids determines whether the vapour will rise and dissipate in the air or whether it sinks into low places such as drains, basements and the bilges of boats. A vapour density of less than one means that vapour will rise.

Examples include natural gas with a vapour density of 0.6 or ammonia vapour at 0.58.

A vapour density of more than one means that the vapour will sink to low places. Examples include LP. Gas with a vapour density of 1.5 or petrol vapour at 2.5.

The majority of flammable liquids give off vapours that are heavier than air and will sink to low places. This means that it may not be possible to smell the vapour cloud at head height. An explosive mixture may have accumulated in low areas and be undetected.

Vapour Clouds

The area covered by the vapour, or the vapour cloud, varies depending on the nature of the liquid itself. For example, water when heated to its boiling point will rapidly change to steam, expanding 1,700 times its volume.

Liquified petroleum gas (LPG) expands in volume 270 times when released from pressure. This vapour can combine with up to 50 times its own volume with air to form an explosive mixture and cover a large area.

Spontaneous Ignition Temperature (SIT)

This is the lowest temperature at which a flammable liquid will ignite without the application of an ignition source. This temperature is higher than the flash point.

Spontaneous ignition will occur in such situations as fat or oil being overheated on a stove or when petrol is spilt onto a very hot motor or exhaust system.

All hot materials need to be thoroughly cooled during the extinguishment of a flammable liquid fire. The failure to reduce the temperature of surrounding materials to below SIT may result in an unexpected re-ignition.

The correct safe storage and handling of flammable liquids is essential to ensure that flammable liquid fires do not develop.

DO NOT STORE: excessive amounts of fuel in sheds or under dwellings, it may be illegal.

LPG cylinders should be cleared of all bush fire fuels and vented away from buildings, (see Fact Sheet 6).

Fire extinguishers must be clearly marked to indicate the types of fires they are designed for. Check the instructions on the extinguisher to ensure that it is suitable for the type of flammable liquids under your control.

Specialist advice can be obtained from the manufacturer, your supplier, NSW Fire Brigades or your local Fire Control Centre.

Be familiar with the use of your extinguisher(s) and check regularly to ensure serviceability.

Flammable liquid fires must be treated with care at all times. They are serious and dangerous as explosions can and do occur.