

## Flammable Liquids

### Understanding the Risk

When a flammable liquid becomes involved in a fire it will contribute greatly to the severity and spread of fire. The flashpoint (FP) of the liquid is the lowest temperature at which the liquid gives off vapours in a quantity capable of forming an ignitable vapour/air mixture.

The three main dangers associated with flammable liquids are:

- An explosion resulting when a flammable vapour/air mixture falls within their explosive limits and comes into contact with an ignition source;
- Fire involving the flow of burning liquid over a wide area;
- The rupture or explosion of unvented or inadequately vented containers – by build up of pressure inside the container when involved in a fire.

The main causes of fires that involve flammable liquids result from:

- Inadequate maintenance;
- Misuse of equipment or disregard of safety procedures/regulations;
- Carelessness;
- Improper or inadequate design;
- Static electricity;
- Poor housekeeping

### The Risk Assessment

An assessment should be undertaken by a competent person and actions taken to eliminate or reduce the potential hazard. The risk assessment should at least include the following measures:



- Identify all flammable liquids that are present and their quantities;
- Put control measures in place to either remove those risks or, where this is not possible, control them;
- Put controls in place to reduce the effects of any incidents involving flammable liquids;
- Prepare plans and procedures to deal with accidents, incidents and emergencies.

### Controlling the Hazard

The possibility of eliminating the risk, by substitution with a non-flammable alternative or an alternative having a FP above 55 °C., should always be thoroughly investigated.

## Ventilation

Either natural or mechanical means should be sufficient to prevent the concentration of the liquid below its lower explosive limit (LEL).

Stores should be at or above ground level unless mechanical ventilation is provided.

Ventilation openings should be at high and low level direct to the outside.

Mechanical ventilation should provide a minimum of six air changes per hour. Extract should be at low level and inlet at high level so as to provide cross-flow. Fan motors should be suitable for the hazard zone.

## Ignition

Sources of ignition should have been removed and electrical equipment in the area should be appropriate for the risk category or zone.

Potential sources of ignition should be identified and either removed or operated at temperatures well below the auto-ignition temperatures of the liquid.

Heating should be appropriate for the hazard zone.

The potential risk of ignition due to a build-up of static electricity should be assessed and measures taken to eliminate it.

Fork-lift trucks should be certificated to the appropriate zone.

## Containment

The liquids should be in suitable containers. Spillages should be contained and prevented from spreading. Bunds and drip trays should be provided where required. Empty containers should be properly managed.

Catchment areas (with capacities not less than 110% of the largest container in the bund or 25% of their aggregate capacity, whichever is the greater) are required to contain a possible flowing liquid fire. The containment of liquids will also reduce the potential risk of contamination to the environment.

Automatic cut-offs with over-fill alarms should be fitted to all enclosed vessels and to all vessels supplied by piped services as a precaution against overfilling.

Where tanks are stored inside a building consideration should be given to providing an emergency dump facility.

## Separation

The liquids should be separated from other stored materials. Flammable liquids should be stored separately from oxidising agents or flammable gases.

Processing or handling of flammable liquids should preferably be in a detached building. Where this is not possible it should be done in a compartment providing a minimum of 2-hours fire resistance.

## Storage

All tanks, vessels and containers should be clearly marked to ensure that personnel are aware of the contents and the potential hazards.

The quantities of flammable liquids kept in working areas should be kept to a minimum; the quantity should not exceed the requirements for the day or shift being worked.

## Fire protection

Portable fire extinguishers should be of an appropriate type. Consideration should also be given to the provision of a fixed fire fighting system e.g. sprinklers with foam additives and/or an automatic fire detection system.

In zoned areas the systems should be intrinsically safe and appropriate for the zone.

For further information, contact your RMC Engineer.

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