Storage of flammable liquids in process areas, workrooms, laboratories and similar working areas

The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) require risks from the indoor storage of Dangerous Substances to be controlled by elimination or by reducing the quantities of such substances in the workplace to a minimum and providing mitigation to protect against foreseeable incidents.

It is recognised that for practical purposes where flammable liquids are used, there is likely to be a need for a limited quantity to be stored in the workroom/working area. It is the responsibility of the employer / dutyholder when carrying out their risk assessment required under DSEAR Regulation 5, to justify the need to store any particular quantity of flammable liquid within a workroom/working area. However, the guiding principle is that only the minimum quantity needed for frequently occurring activities or that required for use during ½ day or one shift should be present in the workroom/working area. Clearly actual quantities will depend on the work activity and also the organisational arrangements for controlling the fire risks in the workroom / working area.

When not in use, containers of flammable liquids needed for current work activities should be kept closed and stored in suitable cabinets or bins of fire-resisting construction and which are designed to retain spills (110% volume of the largest vessel normally stored in it). These should be located in designated areas that are where possible away from the immediate processing area and do not jeopardise the means of escape from the workroom/working area. The flammable liquids should be stored separately from other dangerous substances that may enhance the risk of fire or compromise the integrity of the container or cabinet/bin; for example energetic substances, oxidizers and corrosive materials. It is recognised that these other dangerous substances may be flammable liquids in their own right or held in a flammable liquid. However, it is still inappropriate to store these in the same cabinets or bins with other flammable liquids. [Further guidance on Energetic and spontaneously combustible substances is contained in HS(G)131 published by HSE]

It is recommended that the maximum quantities that may be stored in cabinets and bins are no more than 50 litres for extremely, highly flammable and those flammable liquids with a flashpoint below the maximum ambient temperature of the workroom/working area; and no more than 250 litres for other flammable liquids with a higher flashpoint of up to 55°C.

These quantities are intended to be viewed as recommended maxima representing good industry safe practice, rather than be taken as absolute limits. There is intended to be some flexibility with these limits, where it is recognised that the design of modern day buildings and the pattern of work can sometimes make adherence to these quantities difficult to achieve; for example, in large or open-plan workrooms / working areas. However, where the employer/dutyholder does identify a need to store quantities in excess of the recommended maxima, a robust demonstration of this requirement would need to be made and in particular the risk assessment should take into account:

- The properties of the materials to be stored or handled in the workroom / working area. For mixed storage the worst case situation should be applied, i.e. all materials in the storage cupboard or bin should be considered as being the same material as the one that has the lowest flashpoint;
- The size of the workroom / working area and the number of people working in it;

- The amount of flammable liquids being handled in the workroom / working area and the quantities of liquid that may be accidentally released or spilled;
- Ignition sources in the workroom / working area and potential fire spread in the event of an ignition:
- Exhaust ventilation provision to the workroom / working area and / or the storage cupboard or bin;
- The fire performance of the storage cupboard or bin;
- The arrangements for closing the cupboard or bin doors/lid in the event of a fire;
- Means of escape from the workroom / working area.

The particular objective, in the event of an incident, is to ensure that people can safely escape from the workroom / working area. In this context, the purpose of storing Dangerous Substances in cupboards and bins of appropriate construction and design is to provide a physical barrier to delay the involvement of these materials in a fire and limit the passage of flame and hot gases should the Dangerous Substances subsequently become involved, for sufficient time for people's safe evacuation and the dutyholder's immediate emergency procedures supporting this to be implemented.

Regulation 6 guidance text together with appendices 4 and 5 of the 2013 edition of L138 provide general guidance and details of the performance requirements for fire resisting cupboards and bins. It is important to recognise that these do not specify an absolute test or standard for the cupboard or bin itself, rather they relate to nominal construction principles. Namely:

i. that the materials used to form the sides, top, bottom, door(s) and lid are capable of providing the required fire resistance (i.e. 30 minutes integrity) and reaction to fire (i.e. minimal risk);
ii. that the joints between the sides, top and bottom of cupboards and bins should be free from openings or gaps;
iii. that the lid / doors should be close fitting against the frame of the bin/cupboard, such that there is a nominal overlap between the frame and lid/doors in their closed position;
iv. that the supports and fastenings should be of a material with a melting point greater than 750°C.

These criteria represent the minimum performance requirements for compliance with the current legislation. However, it is to be noted that there are a number of more demanding standards and design specifications, which refer to the fire performance of the complete cabinet structure, including: BS EN 14470-1:2004 'Fire safety storage cabinets – Part 1: Safety storage cabinets for flammable liquids'; Factory Mutual, Underwriters Laboratories and ANSI/NFPA 30 standards. Where standards go beyond the minimum requirements of UK health and safety legislation, it is to be emphasized that their implementation in the UK is not a legal requirement. However, for quantities in excess of the recommended maxima employers/dutyholders may find cabinets with enhanced fire performance help in making their risk assessment demonstration.

It is of course the responsibility of the employer/dutyholder to ensure that cabinets to any particular standard or design specification do meet the minimum legal requirements. Equally, the use of cabinets with enhanced fire performance should not be seen as a substitute for the provision of dedicated store rooms and outdoor storage areas for the safe keeping of containers which are nominally empty or are not needed for current work.