

SAFETY AND HYGIENE REGULATIONS



Servei de Prevenció de Riscos Laborals
UNIVERSITAT POLITÈCNICA DE CATALUNYA

STORAGE OF FLAMMABLE AND COMBUSTIBLE CHEMICALS IN MOVABLE CONTAINERS

CODE

SHR 303

Date:

July 2003

Revision:

00

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CHEMICAL STORAGE ACCORDING TO ROYAL DECREE 379/2001 ON STORAGE OF CHEMICAL PRODUCTS, COMPLEMENTARY TECHNICAL INSTRUCTION (ITC): MIE APQ-001 ON "STORAGE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS"

Storage conditions. Field of application

MIE APQ-001, "Storage of flammable and combustible liquids", refers to the storage of flammable liquids in movable containers with a unit capacity of less than 3,000 litres. Stores of liquids containing less than the following quantities are excluded:

- 50 litres of class B products
- 250 litres of class C products
- 1000 litres of class D products

Storage areas inside buildings must have at least two independent entrances, indicated with signs. The length of the real route (around stacks of goods or other obstacles) to the outside of the building or to a safe evacuation route must be no more than 30 metres. In no case should the arrangement of containers block normal or emergency exits, or hinder access to equipment or areas set aside for safety purposes. One exit is sufficient when the storage area is 25 m² or the distance to the exit is less than 6 metres.

If liquids of different classes are stored in the same stack or shelving unit, all of them should be considered together as a liquid of the most restrictive class. If they are stored in separate stacks or sets of shelves, the sum of the quotients of the amounts stored and the permitted amounts for each class will not be above the value of 1. The floor and the first 100 millimetres (from the floor) of the walls around the entire storage area, including doors and other openings, must be waterproof and watertight to prevent liquids from flowing into adjacent areas. Alternatively, the floor could drain into a safe place.

Subclass B1 products cannot be stored in basements.

CLASSIFICATION OF FLAMMABLE AND COMBUSTIBLE LIQUIDS

1. Class A. Liquids whose absolute vapour pressure at 15°C is higher than 1 bar.

Depending on the temperature at which they are stored, these liquids could be considered:

- a) Subclass A1. Class A products that are stored liquefied at a temperature below 0°C.
- b) Subclass A2. Class A products that are stored liquefied in other conditions.

2. Class B. Products whose flash point is below 55°C that are not included in class A.

Depending on their flash point, they can be classified as:

- a) Subclass B1. Class B products whose flash point is below 38°C.
- b) Subclass B2. Class B products whose flash point is between 38°C and 55°C.

3. Class C. Products whose flash point is between 55°C and 100°C.

4. Class D. Products whose flash point is above 100°C.

If products in classes C and D are stored at temperatures above their flash point, the storage conditions determined for subclass B2 must be met.



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CLASSIFICATION OF STORES: SAFETY CABINETS

Safety cabinets must have at least a fire resistance rating of **RF-15**, as indicated in MIE APQ-001.

Fire resistance (RF) is the quality of a construction element that makes it capable of maintaining for a certain time (in minutes) the conditions of mechanical stability, impermeability to flames and smokes, a lack of emission of flammable gases and thermal insulation when subjected to the action of fire.

Safety cabinets must have a visible sign with the word "**FLAMMABLE**". No more than three cabinets of this type can be placed in the same room, unless each group of three cabinets is separated by at least 30 metres. If they are used for class A products, ventilation to the exterior is required.

According to MIE-APQ-001, the maximum amount of liquids that can be stored in a safety cabinet is **500 litres**. The maximum quantities of each class allowed within a safety cabinet are:

- **100 litres** of class A products
- **250 litres** of class B products
- **500 litres** of class C products
- Or the sum of A, B and C, if it does not exceed the amounts of A and B mentioned above.

This form of storage is ideal for small quantities of flammable liquids that need to be kept close to the workplace. When flammable liquids in small containers are used with a certain degree of frequency in the workplace, safety containers should be used. Ventilation to the outside of a cabinet must be through an opening that leads outdoors, either directly or through a pipe.

Metal cabinets must meet the following requirements:

- Bottom in the form of a tray (5 cm high).
- Joins and joints sealed and coated in intumescent paint.
- Placed on the ground.
- Doors with three anchor points.
- Adjustable feet to level the cabinet.
- If cabinets contain class B liquids, they must be equipped with a fire guard coated in intumescent paint; if they contain class A liquids, they must have ventilation to the exterior.



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CLASSIFICATION OF STORES: STORAGE ROOMS

Storage rooms are designed exclusively for storage and are situated in buildings that are designed for other industrial or non-industrial uses. The structure, the roof and the walls of the room must have a fire resistance rating of RF-120. Doors to the outside that are less than 15 metres from the boundaries of the property or other buildings must have a rating of at least RF-60 and close automatically. However, if there is an automatic fire extinguishing system, the distance is cut to 7.5 m.

There are several kinds of storage room for chemical products:

- **Internal storage rooms (A)**

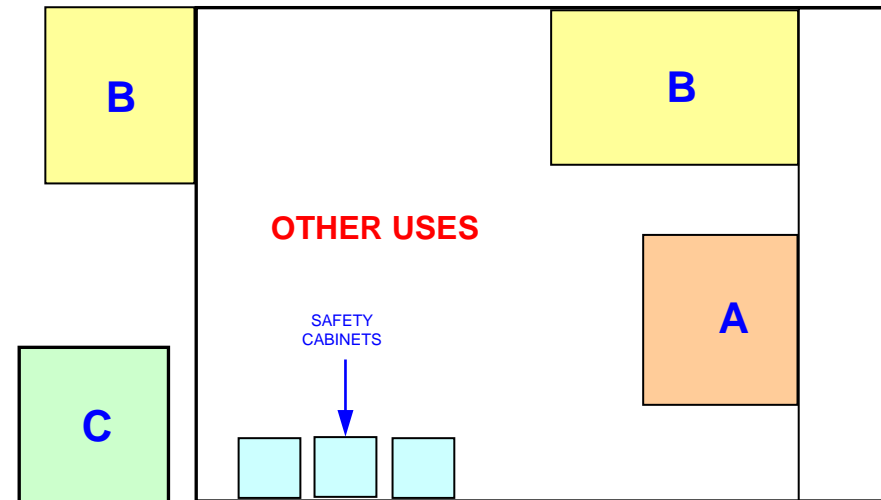
This type of room is totally enclosed inside the building and does not have exterior walls. No container can be situated more than 6 metres from a passageway. The maximum height of the stack is indicated in the Table "Maximum permitted heights and volumes" (H max.), except for class B1 products in containers that are larger than 100 litres, which can only be stored at one height (in one layer).

- **Annexed storage rooms (B)**

This is a room inside a building with one or more exterior walls. It must be easy to access for fire-fighting equipment via windows, openings or light, non-combustible walls. Storage in this kind of room must meet the indications in the table "Maximum permitted heights and volumes".

- **Separate storage rooms (C)**

This type of room does not share any walls with other buildings. Storage in separate rooms must meet the conditions indicated in the table "Maximum permitted heights and volumes".



| Class of liquid | Container measurements (R) | | | | | | | | |
|-----------------|----------------------------|--|--|------------------|--|--|---------------------|--|--|
| | R ≤ 25 L | | | 25 L < R ≤ 250 L | | | 250 L < R ≤ 3,000 L | | |
| | H max (m) | V _p stack (m ³) | V _o overall (m ³) | H max (m) | V _p stack (m ³) | V _o overall (m ³) | H max (m) | V _p stack (m ³) | V _o overall (m ³) |
| B1 Pe < 38°C | 1.5 | 2.5 | 7.5 | 1.8 | 2.5 | 7.5 | 2.5 | 2.5 | 7.5 |
| B1 Pe ≥ 38°C | 3.0 | 5.0 | 15.0 | 2.7 | 5.0 | 15.0 | 2.5 | 7.5 | 15.0 |
| B2 | 3.0 | 15.0 | 45.0 | 3.6 | 15.0 | 45.0 | 2.5 | 15.0 | 45.0 |
| C | 4.5 | 50.0 | 150.0 | 3.6 | 50.0 | 150.0 | 2.5 | 75.0 | 150.0 |
| D | 4.5 | 50.0 | 300.0 | 4.5 | 50.0 | 300.0 | 2.5 | 75.0 | 300.0 |