

Agrichemical Warehousing Standard Association

WAREHOUSING STANDARDS BULLETIN

Updated: January 2002

NUMBER: 7

INDUSTRY POSITION BUILDING, ELECTRICAL & EQUIPMENT CLASSIFICATION FOR THE STORAGE OF AGRICULTURAL CHEMICALS

BUILDING CLASSIFICATION

Agricultural chemical warehouses can be classified as an F2 or F1 depending upon the nature and quantities of material stored.

The definitions for the two classifications are:

- F2 - medium hazard industrial occupancy in which the combustible content is more than 50kg/m² or 1200 MJ/m² of floor area and which is not classified as high industrial occupancy.
- F1 - high hazard industrial occupancy containing sufficient quantities of highly combustible and flammable or explosive materials which, because of their inherent characteristics, constitute a special fire hazard.

The products stored as agricultural chemicals include dangerous goods as defined by the TDG regulations and the N.F.C. TDG regulated flammable liquids and combustible liquids are defined by the N.F.C. (4.1.2.7.). All products are regulated by the Federal Pest Control Products Act (P.C.P.) and the products are stored as agrichemical as defined by the TDG regulation.

To secure maximum safety for the health and safety of employees working within the storage facility and to ensure the integrity of the structure itself, numerous factors must be considered.

These factors include:

- 1) Methods of storage
- 2) Characteristics of the products
- 3) Ventilation of the rooms and/or building
- 4) Potential sources of ignition
- 5) Accidental spill and contaminated fire water containment
- 6) Exterior wall construction
- 7) Fire rated separation walls and closures
- 8) Sprinkler systems

- 9) Employee training
- 10) Personal protective equipment
- 11) A management system to include:
 - a) A risk assessment
 - b) An emergency response plan
 - c) Product inventory control
 - d) Written safe operating procedures
 - e) Maintenance programs
 - f) Safe work permit system

DISCUSSIONS ON FACTORS

1. The storage methods of the products meet the N.F.C. table 3.2.7.6 and table 4.2.7.5 A & B.
2. The product characteristics range from N.F.C. defined Class 1B and 1C flammable liquids and Class II and IIIA combustible liquids to a P.C.P. LD hazard rating of VH (very high hazard) to VLH (very low hazard). N.F.C. requires separation as per the compatibility table 3.2.7.6..
3. The complete warehouse and/or rooms within the warehouse will have positive mechanical ventilation to provide at least 2 air changes/hr.
4. The industry standard is no open flames in the warehouse, regardless of the products stored.
5. From time to time, accidental spills are created by material handling equipment and failure of containers. Because of this, internal containment (10 cm high) is required for the entire warehouse so spilled products cannot leave the warehouse. The warehouse must also be 50 m from storm and catch basins, ditches, open bodies of water, schools, hospitals, nursing homes, detention centres, etc. If closer than 50 m, local authorities (fire department, MOE) must approve and the facility must have a diked area for containment of spills and/or fire fighting water. The industry promotes a "fire control tactics" policy for these facilities, concentrating on protecting adjacent structures/property.
6. The exterior wall construction can be of non combustible materials (masonry, concrete or steel) or if combustible, must have a minimum 1 hr fire resistance rating.
7. Fire rated separation walls within the building where required to meet the occupancy requirements be 2 hr. except when N.F.C. requirements are greater.

8. Sprinkler systems shall be installed when required to meet the N.F.C. requirements.
9. Documented employee training will cover the following areas:
 - a) M.S.D.S./WHMIS
 - b) Fire Extinguisher
 - c) TDG
 - d) Fork lift truck safe operating procedures
 - e) Employee induction
 - f) Emergency response rules
 - g) First aid and CPR training
 - h) First aid training
10. A comprehensive management system with controls to ensure effective operation of the warehouse shall be in effect.

Understanding the industry's Warehousing Standards and knowing that a facility can lose the right to store products if not successful in complying with these standards (determined by an independent third party audit based on audit protocols) the industry views the classification as follows:

A warehouse which store only products in pre-packaged containers in conformance with the industry standards, national and local codes, the building be F2.

A warehouse which dispenses flammable liquids, the building be F1. Dispensing of flammable liquids must be separate from the rest of the building by a 2 hour fire resistance separation and the room must be provided with explosion venting to the outdoors.

The storage only of flammable and combustible liquids (no 1A products) in sealed containers in rooms or building do not need explosion venting.

Flammable liquids in sealed containers offer very little hazard by themselves. When these containers are exposed to open flames, they become hazardous as the heat may cause them to burst, thus allowing the liquid to escape and adding to the intensity of the fire.

Flammable liquids themselves do not burn, it is the vapours from the liquids which burn. The rate at which different liquids vaporize varies greatly depending on their vapour pressure characteristics. Vaporization increases with a rise in temperature, therefore more flammable vapours are present above the flammable liquid at elevated temperature than above the same liquid at normal temperature.

There is more potential hazard associated with flammable liquids with a lower flash point.

ELECTRICAL CLASSIFICATION

Provided the industry standards, N.F.C., and the N.B.C. are followed, the electrical classification for individual storage areas (I.S.A.) will be as follows:

1. a) Class I, Div. 1 within 3 ft. in all directions where dispensing occurs (flammable only).
b) Class I, Div. 2 from 2 ft. beyond the Class I Div.1 area and 20 ft. horizontal up to a level 3 ft. above the floor where dispensing occurs (flammable only).
2. Prepackaged product storage area does not need electrical classification unless storage of N.F.C. Class 1A flammables. Lights should have protective lenses.

EQUIPMENT CLASSIFICATION

Fork lift trucks

- In areas of the warehouse classified as Class 1 Div. 1 electrical, a fork lift truck classified as EX is required.
- In areas of the warehouse classified as Class 1 Div. 2 electrical, a fork lift truck classified as EE or DY is required
- All other areas in the warehouse a fork lift truck need not be classified.