SAFETY MEMO

November 29th, 2021 – Ethanol (C_2H_6O) - CAS # 64-17-5

Did you know?

What is ethanol?

Ethanol, commonly known as ethyl alcohol or EtOH, is a clear, volatile, highly flammable liquid with a slight characteristic odor.

Ethanol has a very low flashpoint and can easily form an explosive mixture. It can be ignited below average room temperature. For example, for a 50% (v/v) ethanol-water mixture, flashpoint is about 24°C / 75°F. Pure ethanol is flammable at 12.5°C / 54.5°F is therefore important to work away from ignition sources such as sparks or flames.

Exposure to atmospheric concentrations limit is 1000ppm (NIOSH Reccommended Exposure Level, OSHA Permitted Exposure level over an 8 hour period). Ethanol vapors may cause dizziness or suffocation. Inhalation or direct contact with it may irritate or burn the skin and eyes, nose, mouth and throat. Fire may produce irritating, corrosive and/or toxic gases.

Where do we find it?

Ethanol is used in processes as:

- Component in alcoholic beverages,
- Manufacture of cleaning products, insecticides or as a disinfectant,
- Raw material for chemical's synthesis,
- Solvent for various chemical reactions/processes,
- Refrigerant (Freezing point of -114.14°C / -173.45°F).

How to protect yourself?

- Skin contact with ethanol should be avoided. Solvent-resistant gloves and clothing should be used when handling ethanol.
- Wear indirect-vent, impact and splash-resistant goggles when handling liquids.
- Where the potential exists for exposure over 1000 ppm, supplied-air respirator with a full facepiece approved by local regulatory authorities should be used.[1]
- Improper use of respirators is dangerous. Respirators should only be used if the employer has implemented a written program, and only by properly trained employees.
- Ensure that manipulations are performed in designated areas and with equipment suitable for the processing and handling of ethanol.

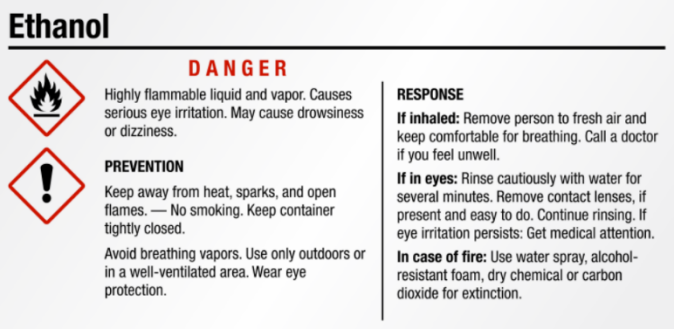
Why is it a hazard?

Potential failure modes such as accidental spills or leaks of flammable liquid (transfer panel error, gasket failure, etc.) can lead to risk of fire and/or explosion. To address that kind of failure, many interrelated strategies can be implemented.

Design Considerations

Flammable liquids are subject to standards, regulations, and codes. Necessary mitigation measures are required, depending on the classification, as per NFPA30 and NFPA 497[2]. For example, ethanol 60-100 vol% is Class IB and from 20-50 vol%, Class IC. Risk analysis workshops are also essential to effectively address all the hazards and to avoid blind spot risks. Here are some exemples of typical mitigation and containment measures in the industry:

- Proper ventilation is required to reduce inhalation risks,
- Fire Protection such as N_2 blanketing or specific sprinklers designed to handle chemical fires,
- Equipment Design (instrumentation, automation, detection devices),
- Primary and secondary containment (liquid tight construction, curbs, dedicaded drainage system),
- Electrical classification (equipment, rooms),
- SOPs.



[1] *The information contained in the Laporte safety memo's is for information purposes only. These memos are not designed to supplement or supersede provincial/state or federally legislated requirements. Always validate and follow local legislation.*

[2] NFC applicable in Quebec refers to the 2012 editions of these codes

LAPORTE