

# Marine Newslink

AUGUST 2020



## FEATURE ARTICLE

Ethanol

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## PHOTO(S) OF THE MONTH

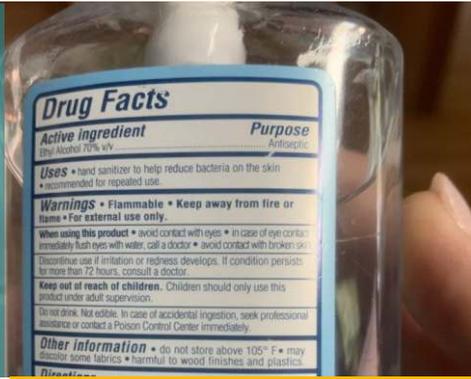
Ethanol

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## BACK TO BASICS

Question Of The Month

# ETHANOL



By now, you have been reminded about a millionth of times, about the benefits of washing or sanitising your hands. The current state of pandemic is such that the risks & dangers are increasing every day. The only mantra for being safe is washing or sanitising your hands and keeping them away from your face. Sanitisers are required to be alcohol-based and the concentration of alcohol must be as high as possible. The one ingredient that stands apart in such a sanitiser is Ethyl Alcohol also known as Ethanol.

As soon as the lockdown was announced, many alcohol making companies were pushed to make hand sanitisers on priority and make them available to the masses. Alcohol rub sanitisers containing at least 70% alcohol (mainly ethyl alcohol) kill 99.9% of the bacteria on hands.



Ethanol is also called Ethyl Alcohol, pure alcohol, grain alcohol, or drinking alcohol. Ethanol is produced both as a petrochemical, through the hydration of ethylene and via biological processes, by fermenting sugar with yeast.

Ethanol can be produced from any biological feedstock (corn, barley, wheat) that contains substantial amounts of sugar or materials that can be converted into sugar (starch, cellulose).

The ethanol production process starts by grinding up the feedstock, so it is more easily and quickly processed in the following steps. Once ground up, the sugar is either dissolved out of the material or the starch or cellulose is converted into sugar. The sugar is then fed to microbes that use it for food, producing ethanol and carbon dioxide in the process. A final step purifies the ethanol to the desired concentration.

It is the pivotal ingredient in alcoholic drinks. It is an inflammable, colourless, slightly toxic compound with a distinct odour. It is also the alcohol that is present in all alcoholic beverages. Another major use of Ethanol is for industrial purposes and finds use as a clean burning biofuel

## ***Grades of Ethanol***

Ethanol is available in a range of purities that result from its production or in the case of denatured alcohol, are introduced intentionally.

## ***Denatured alcohol***

Pure Ethanol and alcoholic beverages are heavily taxed as a psychoactive drug, but Ethanol has many uses that do not involve consumption by humans.

## ***Absolute alcohol***

Absolute or anhydrous alcohol refers to Ethanol with a low water content. There are various grades with maximum water contents ranging from 1% to ppm levels. Absolute alcohol is not intended for human consumption. Absolute Ethanol is also used as a solvent for laboratory and industrial applications, where water will react with other chemicals, and as fuel alcohol.

## ***Rectified spirits***

Rectified spirit, an azeotropic composition of 96% Ethanol containing 4% water, is used instead of anhydrous Ethanol for various purposes.

Wine spirits are about 94% Ethanol (188 proof). The impurities are different from those in 95% (190 proof) laboratory Ethanol.

## APPLICATION

Ethanol has widespread use as a solvent of substances intended for human contact or consumption and is widely used in various products such as alcoholic beverages, solvents, perfumes and toiletries, disinfectants, polishes, as a fuel additive and in the manufacture of plastics, rubber and drugs. It is also increasingly being used as a biofuel. Alcohol-based hand gels in the form of liquids, foams and gels can contain up to 95% Ethanol.

An Ethanol-water solution that contains 40% ABV (alcohol by volume) will catch fire if heated to about 26 °C and if an ignition source is applied to it. This is called its flash point. The flash point of pure Ethanol is 16.60 °C, less than average room temperature.

**Boiling Point:** The lowest known value is 78.5°C (Ethyl Alcohol 200 Proof). Weighted average: 79.58°C

**Melting Point:** May start to solidify at -114.1°C based on data for: Ethyl Alcohol 200 Proof.

**Critical Temperature:** The lowest known value is 243°C (Ethyl Alcohol 200 Proof).

**Specific Gravity:** Weighted average: 0.8 (Water = 1)

## STORAGE



Store in a segregated and approved area. Container must be kept in a cool, well-ventilated area. Container must be tightly closed and sealed until ready for use. All possibilities of sources of ignition (spark or flame) should be avoided. Should not be stored above temperatures of 23°C.

## PACKAGING

**ETHANOL**, in its original form, can be carried in:

Drums & Jerrycans of various sizes and quantities. HDPE Drums & Steel Drums (250 L/194 Kg Per HDPE Plastics drums on Wooden Sheet. Properly Strapped 210 L/165 kg or 167 kg per Steel Drums or HDPE Plastic drums, on Wooden Pallets)



METAL DRUMS



JERRYCAN OR CARBOY



4 DRUMS ON ONE PALLET



20 PALLETS PER 20' FCL

Shipping containers can carry approximately 18.5 – 20 MT of Ethanol, depending upon the size of the container.

Wine spirits are about 94% Ethanol (188 proof). The impurities are different from those in 95% (190 proof) laboratory Ethanol.



ISO TANK

SHIPPING CONTAINER

ISO tanks of 1000 litres. These can also be stuffed inside desired shipping container.

## WARNING/CAUTION

- Ethanol packaging & transportation modes need to carry appropriate placards & warning signs to mention FLAMMABLE.
- This placard displays a UN number & Hazard Class Rating.



PLCARD-EIP-1170T

## TRANSPORTATION & RISKS



RAIL CAR

- Ethanol can be shipped in bulk by Ships (smaller quantities), Road & Rail Tanker and by various break-bulk packaging mode.



TANKER SHIP

- While transporting Ethanol requisite precautions like warning labels, not mixing break-bulk loads with other hazardous cargoes must be strictly adhered. Remember that vapours may also form from additional heat and the flashpoint is 16.6, which is even lower than room temperature. The trucks & rail car are usually dedicated carrier for Ethanol transportation.
- Loading & unloading operations should be done in well-ventilated area.
- Exhausts of trucks/tankers should be covered with flame arrestors.
- Adulteration is a huge risk if the carrying medium is not cleaned & prepared properly or may have residues of other previous cargoes. The risk is highest on road tankers, followed by rail cars & almost nil when packed in break-bulk form.

- Various formulations of Ethanol also make it the most preferred ingredient for making alcohol and hence its theft perception is also very high. Many Indian State Governments required trucks with GPS facility for transportation of Ethanol.

Please note that this article covers Ethanol as Ethyl Alcohol, which is the base product.



**PLEASE KEEP A PROPER ALCOHOL CONCENTRATE SANITIZER HANDY AT ALL TIMES.**

# PHOTOS OF THE MONTH



**POTM - Ethanol Plant**



**POTM - Ethanol train derailed**

# BACK-TO-BASICS

## QUESTION OF THE MONTH

Ethanol is primarily used in manufacturing of which product & what is its second most usage?

## LAST MONTH'S QUESTION

Consignment of seeds were exported and upon reaching destination country, the port authorities noted that some of the wooden pallets, used in the packing, were infested.

However, there was no sign of infestation to the cargo. It was reported in the joint survey that probably the wood was not dried, treated or fumigated properly and hence infestation had occurred.

Port authorities ordered destruction of the entire consignment. **Whether loss is payable?**

## LAST MONTH'S ANSWER

The loss is not payable as the wooden pallets for packing are damaged probably due to improper treatment which indicates that the cargo was transported vide insufficient packing.

As per general exclusion number 4.3 of ICC(A) 2009, loss, damage or expense caused by insufficiency or unsuitability of packing is not covered in the insurance. Also, there is no sign of infestation to the cargo.

## CORRECT ANSWERS SENT BY: (In order of replies received)

- SOHAG PARIKH - Cadila Healthcare Ltd., Ahmedabad
- V.P. MOHANKUMAR - LINK-K Insurance Broker Co. Pvt. Ltd., Coimbatore
- SUMIT BOHRA - IndiaNivesh Insurance Brokers Pvt. Ltd., Mumbai 400 013
- SHRUTI CHAUBEY - Zoom Insurance Brokers Pvt. Ltd., Gurugram
- SMITA CHACHAD - IndiaNivesh Insurance Brokers Pvt. Ltd., Mumbai
- HEMA RAGHAV - Optima Insurance Brokers Pvt. Ltd., New Delhi
- BHARAT BHUSHAN - Optima Insurance Brokers Pvt. Ltd., New Delhi

## From Tata-AIG

- Ramesh Prabhu – Tata AIG General Insurance Co. Ltd., Coimbatore
- MD Maaz Shaikh – Tata-AIG General Insurance Co. Ltd., Mumbai

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