



Frequently Asked Questions About the Safe Handling & Use of Methanol

Q. What is methanol?

A. Methanol, also known as wood alcohol or methyl alcohol, is made primarily from natural gas or coal, and can also be produced from renewable resources such as landfill gas and digester gas. Methanol is actually present within the human body in small quantities from eating fruits and vegetables, and drinking diet soda containing artificial sweeteners. According to the FDA, as much as 500 milligrams per day of methanol is safe in an adult's diet. In the body, methanol is metabolized in the liver, converted first to formaldehyde, and then to formate. As a building block for many biological molecules, formate is essential for survival. Moreover, methanol is an essential chemical building block used to make hundreds of products that touch our daily lives, from plastics and paints, to construction materials and clothing.

Q. What does methanol have to do with biodiesel?

A. Methanol plays a critical role in the production of biodiesel. Biodiesel is generally made when fats and oils are chemically reacted with methanol, and a catalyst, typically sodium or potassium hydroxide (i.e., lye), to produce an ester, or biodiesel.

Q. Is methanol hazardous or dangerous?

A. Yes, methanol is a hazardous chemical that is highly flammable and toxic. Methanol must be properly stored, transported and used by people that have been properly trained in its handling. Methanol is extremely toxic to humans if ingested or if vapors are inhaled. Direct exposure to methanol should be avoided, as methanol can be harmful if swallowed, absorbed through the skin, or inhaled. Ingestion of as little as one to four ounces can cause irreversible injury to the nervous system, blindness or even death. Methanol can cause poisoning, systemic acidosis, optic nerve damage and central nervous system (CNS) effects. Methanol can also degrease the skin, which may cause dermatitis. Symptoms of acute methanol exposure may include headache, weakness, drowsiness, nausea, difficult breathing, drunkenness, eye irritation, blurred vision, loss of consciousness, and possibly death. Patients may improve and then get worse again up to 30 hours later.

Q. What can I do to reduce my exposure to methanol?

A. First, make sure that you receive proper training and guidance on handling not only methanol, but biodiesel as well. Be aware of the hazardous properties of methanol, and exercise caution to avoid contact with it. Avoid prolonged or repeated breathing of methanol vapors. Proper ventilation is required to ensure safe working conditions. The type of ventilation will depend upon such factors as dead air spaces, temperature, convection currents and wind direction and must be considered when determining equipment location, type and capacity. If mechanical ventilation is used, sparkproof fans should be implemented. At a minimum, wear side-shielded safety spectacles and task appropriate gloves.

Q. What do I do if I breathe in methanol or spill some on myself?

- A. In case of methanol contact with skin, remove contaminated clothing, wash with soap and water for 15 minutes, and seek medical attention if irritation occurs. If methanol comes in direct contact with eyes, immediately flush eyes with copious amounts of tepid water for at least 15 minutes. The patient should be taken to a health care facility, and referral to an ophthalmologist considered. In case of inhalation of methanol vapors, remove the individual to fresh air. Asphyxiation from vapors may require artificial respiration. Ingestion of methanol is life threatening. Onset of symptoms may be delayed for 18 to 24 hours after ingestion. Due to the risks of aspiration into the lungs, do NOT induce vomiting. The decision to induce vomiting should be left to a medical professional attending the victim. Transport immediately to a health care facility where standard methanol ingestion treatment can be administered. Immediate medical attention is critical!

Q. What do I do if I spill methanol somewhere?

- A. If a methanol spill occurs, stop or reduce discharge of material if this can be done without risk. Call your local fire department for immediate assistance. Isolate the spill or leak area immediately for at least 330 to 660 feet in all directions. Eliminate all sources of ignition, and stay upwind. Do not touch or walk through the spilled material. Prevent methanol from entering into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. For small spills (up to 55-gallon drum) absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. For large spills, dike far ahead of liquid spill for later disposal, and follow local emergency protocol for handling.

Spills into large natural bodies of water, such as rivers and oceans, cannot be contained. For releases into soil, surface water or groundwater, methanol has a half-life of just one to seven days, and given its high rate of biodegradation, methanol spills are not likely to persist. Methanol is used extensively in the nation's wastewater treatment facilities to reverse the damaging effects of nitrate buildup in sensitive aquifers and waterways by accelerating biodegradation. As a flammable and toxic chemical, caution must be exercised to avoid contact with methanol.

Q. What do I do if a fire starts around methanol?

- A. Accumulations of methanol vapors in confined spaces may explode if ignited, and containers filled with methanol may rupture violently if exposed to fire or excessive heat for a prolonged duration. Methanol flames are almost invisible in bright sunlight conditions, but they may be detected by the heat generated or the burning of other materials. Large amounts of water will remove heat and can be effective in diluting methanol to the point where most fires can be readily extinguished. To prevent fires keep open flames, sparks and oxidants away from methanol. Dry chemical powder, carbon dioxide and alcohol-resistant foam extinguish methanol fires by oxygen deprivation. Firefighters should use full-face, self-contained breathing apparatus, and wear impervious clothing, gloves and boots. For larger fires involving a tank, rail car or tank truck, isolate for ½ mile in all directions, also consider evacuation for ½ mile in all directions. Keep any methanol containers cool by spraying with water.

Q. How should I store methanol?

A. Methanol should always be kept within closed systems or approved containers and never left open to the atmosphere. Containers should be labeled in accordance with local regulations and site requirements. You should have comprehensive product handling procedures and systems in place at all storage and transfer points. Materials and methods of construction must be compatible with methanol service. Methanol is non-corrosive to most metals at ambient temperatures; exceptions include lead, magnesium and platinum. Mild steel is usually selected as the construction material. Tanks built with copper alloys, zinc (including galvanized steel), aluminum or plastics are not suitable for methanol-water solutions. While plastics can be used for short-term storage, they are generally not recommended for long-term storage due to deterioration effects and the subsequent risk of contamination. Furthermore, coatings of copper (or copper alloys), zinc (including galvanized steel) or aluminum are attacked slowly.

Q. How should I dispose of excess methanol?

A. Large quantities of waste methanol can either be disposed of at a licensed waste solvent company or reclaimed by filtration and distillation. Waste methanol, or water contaminated with methanol, must never be discharged directly into sewers or surface waters. Do NOT pour methanol down the drain, on the ground or into any body of water. Methanol is a hazardous material and must be disposed of properly. Check with local environmental officials for instructions on how to safely dispose of methanol in your community.

Q. How can I buy methanol?

A. The Methanol Institute serves as the trade association for the global methanol industry, and our members supply most of the world's methanol. Biodiesel facility operators and engineering firms interested in obtaining methanol for biodiesel production should visit our web site at www.methanol.org. Click on the "Biodiesel" page, and go to "Want to Purchase Methanol: Fill out our Methanol Source Request." Simply complete and submit this on-line form, letting us know what your methanol needs are, and we will forward this form to major methanol suppliers and encourage them to contact with you.

Q. Where can I find more information?

A. Again, visit the "Biodiesel" section of our web site at www.methanol.org, and click on the report "A Biodiesel Primer: Market & Public Policy Developments, Quality, Standards and Handling." You can also visit the web site of the National Biodiesel Board at www.biodiesel.org.