

ANOXKALDNES

Tracer™ Glycols

Removal of glycols with AnoxKaldnes™ Moving Bed Biofilm Reactors (MBBRs)

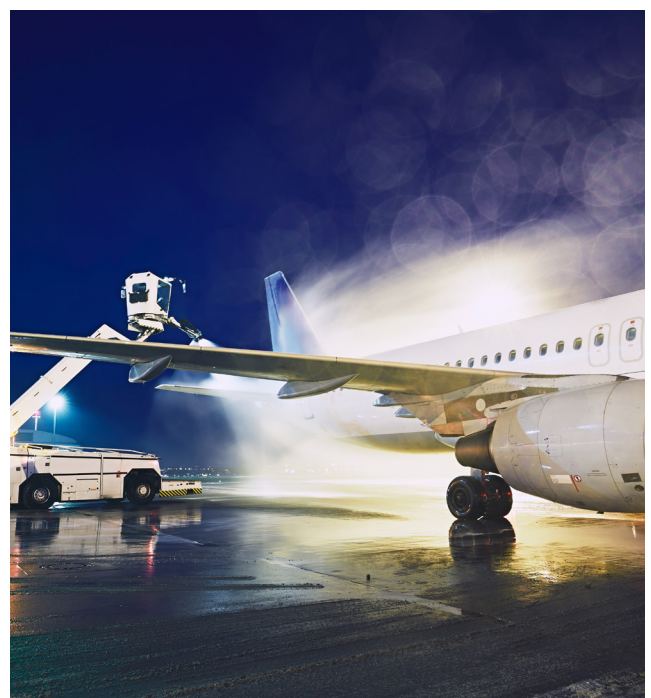
Industrial effluents can often be loaded with special and complex compounds. Some of these compounds are difficult to remove and can also be harmful to the environment and living organisms if left untreated. A group of these special compounds is glycols that can be present in different forms, for example, mono-, tri- or polyethylene glycols (MEG, TEG or PEGs) and monopropylene glycol (MPG).

Biological treatment of glycols

In general, glycols are organic compounds known as diols that can be biologically treated. Microorganisms can utilise glycols as energy and/or carbon sources during aerobic and anoxic/anaerobic degradation. It is understood that some level of acclimation or selection of microbial biomass is necessary for the biological treatment process to be able to degrade these compounds. Overall, the biodegradability of glycols depends on the type of compound. Biofilm technologies, which are able to select and retain microbial biomass immobilised upon biofilm supports, have proven advantageous for high removal efficiencies and process stability during biological treatment of glycols.

Why are glycols of concern?

Polyethylene glycols (PEGs) are water soluble polymers that are widely used in the production of pharmaceuticals, cosmetics, and chemicals, including lubricants, surfactants and anti-freezing liquids. Glycols such as monoethylene glycol (MEG) and monopropylene glycol (MPG) are used in several applications with focus on antifreezing and de-icing agents and solvents. PEGs and MEG are industrially produced in large amounts worldwide and they tend to reach wastewater treatment plants if captured in sewage or industrial wastewaters. The biodegradability of these compounds depends on the types of PEGs (for example, molecular weight), their concentrations and loads, and the adaptability of the microorganisms in the treatment plant.



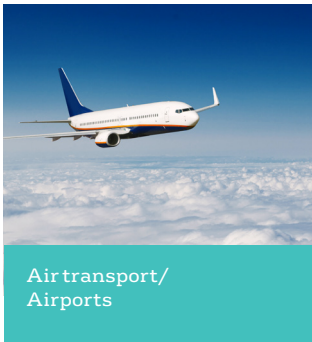
Water contaminated with glycols

Typical wastewaters or water streams contaminated with glycols that need special treatment are those generated from de-icing operations at airports that are exposed to freezing temperatures during the winter months.

De-icing procedures are generally applied to aircrafts, but in some instances also to runways and parking areas. Glycols are a major component of de-icing agents; specifically, monoethylene glycol (MEG), monopropylene glycol (MPG) and diethylene glycol are commonly used.

Glycols are also associated with effluents from the oil and gas industry. It is not uncommon for glycols to be present together with toxic aromatic compounds or phenols (See also Tracer™ Phenols) in contaminated waters. Contaminated waters with glycols can also originate from waste glycols from the chemical industry.

Industrial applications for Tracer™ Glycols MBBRs



Using AnoxKaldnes technologies to remove glycols

AnoxKaldnes with other Veolia Water Technologies subsidiaries have demonstrated the technical feasibility of using Tracer™ Glycols MBBRs for the treatment of MEG/TEG/MPG-contaminated effluents even at very cold temperatures (2-4°C). From bench- and pilot-scale testing by AnoxKaldnes Services, full-scale process solutions have been built for the efficient removal of glycols from different de-icing and waste streams in Europe. Tracer™ Glycols MBBRs have been designed as single process solutions or incorporated into staged biological treatment processes that can handle the seasonality of such contaminated waters.

Feel free to contact us for more information about how AnoxKaldnes Tracer™ technology creates new possibilities in biologically removing harmful compounds in industrial wastewater.