



# Trainer Fog Fluid Report

## Trainer, the moral choice

Trainer Professional maintains a strong environmental and ethical focus across our modern facilities in Denmark, the United Kingdom, and China. All our manufacturing facilities house state-of-the-art processes using a high degree of automation. Moreover, we track our energy consumption, waste materials disposal, and a number of other parameters at all sites, including at our headquarters in Aarhus, Denmark.

As a global company, we wish to minimize the potentially harmful effects of such activities where and whenever possible. Trainer Professional is committed to continual improvements in environmental performance and prevention of pollution. Corporate social responsibility is an important factor for us and shows in our production processes as well as the fluids and products we manufacture.

At Trainer, environmental regulations, laws and codes of practice are regarded as setting the minimum standards of environmental performance, and will never be compromised. As part of our continuous drive for high performance in all aspects of business, we have developed a comprehensive policy statement that will enable us to set targets by which our efforts towards sustainable environmental improvement can be monitored on a regular basis.

## Trainer, your guarantor for REACH compliance

At Trainer, we aspire to continue being the industry's preferred supplier of lighting and smoke equipment, as well as fog, haze and heavy fog fluid. Only by continually working on sustaining and improving safety can this be achieved. This is why Trainer is at the forefront when it comes to complying with and upholding contemporary legislation and rules.

Together with some of Scandinavia's leading chemical consultancy firms, Trainer is cooperating to ensure the new European chemical legislation, REACH, is upheld and complied with. Effectively this means that the products you purchase from Trainer are on par with the latest REACH legislation, and hence guaranteed to be non-toxic.

As a customer of Trainer fluid, should you have questions or are approached by your own customers regarding REACH, feel free to contact us and we will assist you with any enquiry.

## Trainer fluids

Trainer offers the widest and most popular range of atmosphere-generating fog, haze and heavy fog fluid around. But it is not down to chance that Trainer has become the industry's preferred supplier of fluids; it is years of experience and uncompromising effort in always being number one.

At Trainer, we focus on quality, reliance and safety in our products. This mindset not only shows in our technologically superior products, ultra reliant fog generation and state-of-the-art fluids, but throughout the lifetime of our products and fluids.

## What goes in, comes out

Fluids for fog generation are no different than any other product you might buy. The quality of the raw materials used will shape the end result. That is why we only purchase the best food grade quality glycols to ensure optimal performance.

Trainer fluids are made up of two ingredients:

- Food grade glycols
- Demineralized water

Trainer fluids are produced at our state-of-the-art, fully-automated fluid production facility in Lincolnshire, England. A virtually sterile environment is our guarantee of a pure and precise product that delivers the same effect over and over again. This means that Smoke-Cloak fluid never comes in contact with the environment, or humans, thereby ensuring a 100% bacteria free and sterile fluid. The system complies with our ISO standard, ensuring superior quality and safety standards. Nowhere else in the industry will you find the same attention to detail, safety and environmental consciousness?

We want you to be absolutely satisfied and feel safe operating our equipment. Only by using Trainer fluid are you 100% guaranteed that your fog machine will operate optimally and safely. Trainer is your guarantor for 100% clean and superior fluid; not compromising your health or your customer's health over price and quality of product.



## Meet the family

Trainer has an extensive fluid portfolio with no less than 10 different fluid types covering all possible segments, machines and situations. Furthermore, with our high-tech fluid plant, we can customize any fluid to your own specification with very little tolerance.

See the Trainer family of fluid products at [www.training-smoke.com](http://www.training-smoke.com) where you can download more information, specification sheets and Material Safety Data Sheets (MSDS), or contact the Trainer sales team for further information.

## Intrinsic properties of Trainer fluid

The most common glycol components in theatrical fogs include ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, dipropylene glycol, butylene glycol, and glycerol. Two of these glycols have proven to be extremely safe and nontoxic, namely propylene glycol and triethylene glycol, the glycols Trainer uses.

The glycols Trainer uses are:

Monopropylene Glycol (C<sub>3</sub>H<sub>8</sub>O<sub>2</sub>) (MPG) – CAS: 57-55-6  
Triethylene Glycol (C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>) (TEG) – CAS: 112-27-6

In general, the toxicity of glycols under normal exposure scenarios can be rated as very low. That is, under normal exposure intensities encountered in common industrial environments, glycols are not expected to cause serious health problems. Since glycols are poly-functional alcohols, exposure to any of these substances may cause a drying of mucous membranes, resulting in irritation and drying of the eyes and respiratory tract.

## Our glycols are used every day

Monopropylene Glycol is widely used as an ingredient in a diverse range of cosmetics and personal care products. It provides outstanding functionality as a solvent, coupling agent, carrier, emulsion stabilizer, dispersant, softening agent, viscosity modifier and humectants.

Glycols are used in the following industrial consumer products:

- Oral care (mouthwash, toothpaste)
- Skin care (cream, lotion and oil)
- Deodorants and antiperspirants (roll and stick)
- Hair care (shampoo, conditioner and styler, coloring)
- Shaving (cream, foam, gel, aftershave)
- Bath and shower soaps, gels and moisturizers
- Body care (wipes, antiseptic)
- Cleaners and disinfectants

Furthermore, propylene glycol is used as a humectants food additive. Due to the nature of the glycols, they are rated as very low toxicity; hence propylene glycol is also used for medical care.

## Studies regarding fog generation

Throughout history, the field of fog generation has been studied numerous times. Time after time it has been concluded that the combination of tri-ethylene and monopropylene (the combination Trainer uses), is not toxic and one of the best low-toxic combinations in generating fog.

In terms of inhalation of both MPG and TEG, the risk assessment from the manufacturers of the substances reveals only mild irritation of the nose and throat. In terms of ingestion, the risk assessments are evaluated to be mild irritation of the gastrointestinal tract. Please see the MSDS for MPG and TEG for further information regarding the glycols' intrinsic properties and visit [www.training-smoke.com](http://www.training-smoke.com) for the Safety Data Sheets for our complete fluid range.

## Findings from previous studies

According to a report made by The Cohen Group in 1997 regarding the health and safety of glycol fogging, it is stated that:


"...Prolonged and repeated inhalation of triethylene glycol and propylene glycol concentrations well above those present in high-density fog theatrical productions has been repeatedly demonstrated to not pose a health hazard to human subjects..."

In studies made by Dr. B.A. Colenutt at Brunel University (1985) it is argued that the only organic compounds which are produced by water based glycol fogging is the mentioned glycols added to the fluid. Colenutt argues:

"...This result suggested that propylene glycol was the only organic compound present and that no decomposition had occurred."

Furthermore K. G. Ruling (2002) argues in the report: "Fake fog and Ingestion" that:

"...The chemicals used in the fog fluids are not toxic. Despite some claims to the contrary, they are not carcinogenic and they do not cause asthma..."



Ruling addresses the notion of inhalation as well and argues that:

“...There are similarly few problems with inhalation. The Actors’ Equity Association, which if anything has a conservative bias towards allowable limits, sets forth a recommended level limiting an actor’s exposure to 40 milligrams per cubic meter...”

This leads to the question of peak exposures to fog generation.

### **Peak exposures**

Even peak exposures of very high doses of glycol fog are not hazardous. However, a very harmless and normal “side effect” with peak exposures of glycol fog can be coughing due to irritation of the upper respiratory tract. Glycols, being poly-functional, can irritate the mucous membranes as it has a desiccate effect. The cough and irritation is, however, very brief and should disappear as soon as the source is removed and the exposure returns to normal levels.

The same goes for the possible side-effect of watery eyes. This is backed up in an ESTA report mentioning that: “the chemical nature of glycols is such that prolonged or repeated contact with a glycol mist is likely to dry out moist tissues (i.e., the mucous membranes of the upper respiratory track and, possibly, the eye).”

It is important to mention that it is only some people who are particularly sensitive to these side effects, while some are more or less resistant to it. Furthermore, normal use of smoke effects should not cause these effects to appear.

Water based glycol fogging has been used for decades by the theatrical industry and to date no serious health issues in terms of ingestion or inhalation of glycol fog have come to our attention, nor do any studies or reports claim this. Actors, performers, cast and various technical crew work with fog every day, up to 8 hours a day throughout a lifetime, and still no cases of serious health issues have arisen.

However, Trainer would never rely solely on historical data or other associations’ studies. That is why Trainer has conducted rigorous studies to prove the harmless nature of our products and fluids, both to man and environment.

### **Trainer studies**

As a part of Trainer’s drive towards improved safety and customer satisfaction, we have conducted rigorous studies regarding fog-generation in cooperation with the UK’s leading Risk Management consultancy firms and the Danish Technological Institute.

All three Trainer studies (1989, 1997, 1997) suggest that, under normal use, Trainer products do not exceed the limits of particulate suspension, either in the working environment or in normal daily use. This is extremely important to know for customers as fog/haze machines are often used in public places, exposing third parties to fog/haze. It is the responsibility of the owner of the public venue to ensure the safety of anyone present. That is why using safe equipment and fluid is crucial.

Furthermore, the studies concluded that Trainer fluid does not generate thermal decomposition, resulting in unwanted additives to the fog. In addition to this, the researchers did not find any additive in the fluid besides the expected components, i.e. the constituents of the fog fluid. The researchers concluded that the product was not a dangerous chemical substance.

In addition to the above, the researchers concluded that: “The individual components in Trainer fog fluid can not be described as poisonous or harmful for human beings by oral exposure or by inhalation...”

Our studies naturally only cover Trainer machines and Trainer fluids. This is why we can not stress enough the importance of using Trainer fluid with Trainer machines for your safety and the safety of your customers.

Effectively this means that producers of fog/haze generating equipment can submit their machines for Actors Equity testing, and hereby gain approved calibration factors, as well as time and distance factors to ensure the safety of Actors Equity production sites as well as general production sites.

Trainer Professional has indeed recognized the importance of Actors Equity, which compliments our general high standards of health and safety awareness. Therefore, Trainer Professional has submitted several products to the Actors Equity test, and the test reports are available at [www.training-smoke.com](http://www.training-smoke.com), or can be obtained by contacting your local Trainer sales office.

### **Reliability, Quality and Value**

We are pleased to be the industry’s preferred supplier of fog fluid, ensuring safety, superior performance and reliability all over the globe.